Computer Algebra
Independent Integration Tests

Summer 2023 edition

5-Inverse-trig-functions/5.1-Inverse-sine/144-5.1.5-Inverse-sine-functions

Nasser M. Abbasi

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Contents

CHAPTER 1

INTRODUCTION

This report gives the result of running the computer algebra independent integration test.The download section in on the main webpage contains links to download the problems in plain text format used for all CAS systems. The number of integrals in this report is [474]. This is test number [144].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

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

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

Sympy was run directly in Python not via sagemath.

1.2 Results

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

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

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

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

System	% solved	% Failed
Rubi	99.58 (472)	0.42 (2)
Mathematica	98.31 (466)	1.69 (8)
Maple	79.75 (378)	20.25 (96)
Giac	53.16 (252)	46.84 (222)
Fricas	43.46 (206)	56.54 (268)
Sympy	33.97 (161)	66.03 (313)
Maxima	24.26 (115)	75.74 (359)
Mupad	18.78 (89)	81.22 (385)

Table 1.1: Percentage solved for each CAS

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

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

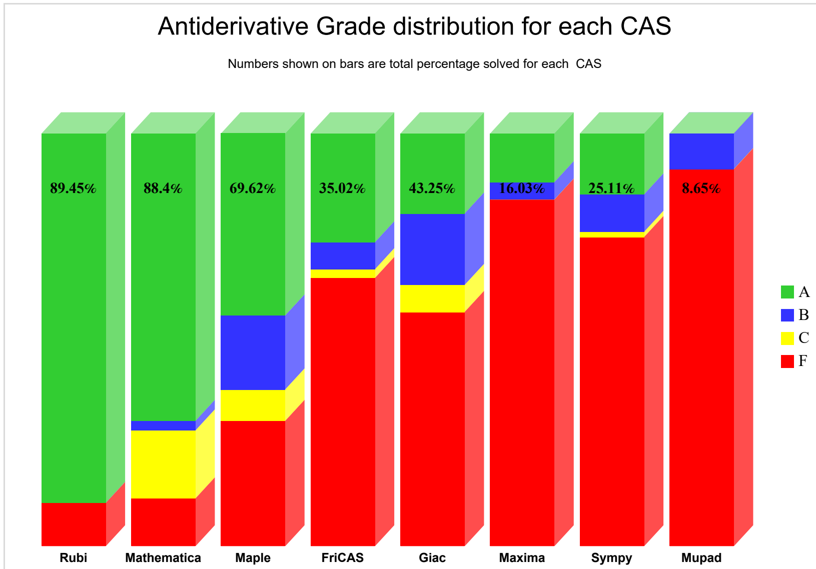
Table 1.2: Description of grading applied to integration result

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

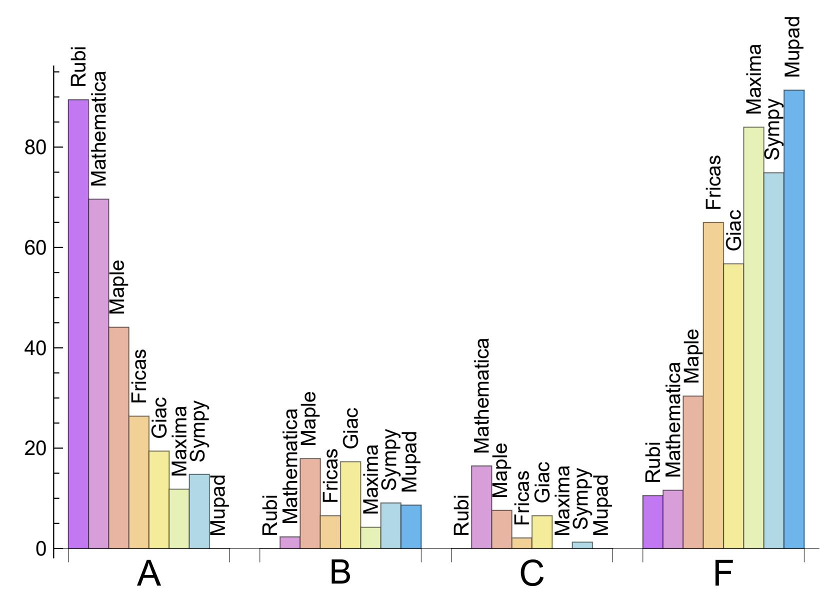
System	% A grade	% B grade	% C grade	% F grade
Rubi	89.451	0.000	0.000	10.549
Mathematica	69.620	2.321	16.456	11.603
Maple	44.093	17.932	7.595	30.380
Fricas	26.371	6.540	2.110	64.979
Giac	19.409	17.300	6.540	56.751
Sympy	14.768	9.072	1.266	74.895
Maxima	11.814	4.219	0.000	83.966
Mupad	0.000	8.650	0.000	91.350

Table 1.3: Antiderivative Grade distribution of each CAS

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



The figure below compares the grades of the CAS systems.



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

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	2	100.00	0.00	0.00
Mathematica	8	87.50	12.50	0.00
Maple	96	100.00	0.00	0.00
Giac	222	76.58	0.45	22.97
Fricas	268	69.78	0.37	29.85
Sympy	313	87.22	9.58	3.19
Maxima	359	72.98	3.06	23.96
Mupad	385	0.00	100.00	0.00

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

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

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

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

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

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

System	Mean time (sec)
Rubi	0.30
Mupad	0.38
Giac	0.70
Maple	1.13
Mathematica	1.81
Fricas	3.06
Maxima	3.09
Sympy	5.43

Table 1.5: Time performance for each CAS

System	Mean size	Normalized mean	Median size	Normalized median
Mupad	40.96	1.12	25.00	1.00
Maxima	165.24	3.17	61.00	1.12
Mathematica	217.32	1.02	134.00	0.95
Fricas	242.01	1.70	81.50	1.19
Rubi	253.19	1.01	144.00	1.00
Sympy	277.27	1.92	76.00	1.33
Giac	497.48	2.52	151.00	1.41
Maple	612.02	1.79	203.00	1.37

Table 1.6: Leaf size performance for each CAS

1.4 Performance based on number of rules Rubi used

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

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

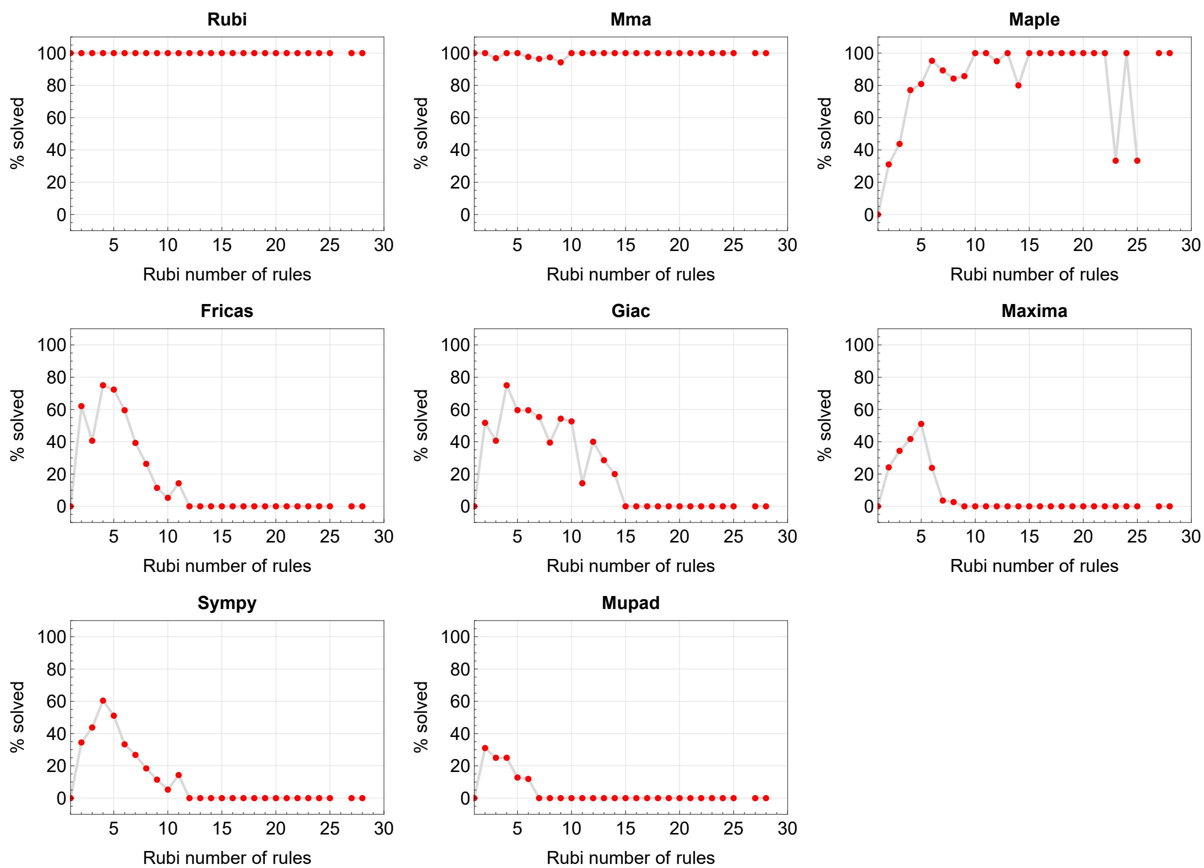


Figure 1.1: Solving statistics per number of Rubi rules used

1.5 Performance based on number of steps Rubi used

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

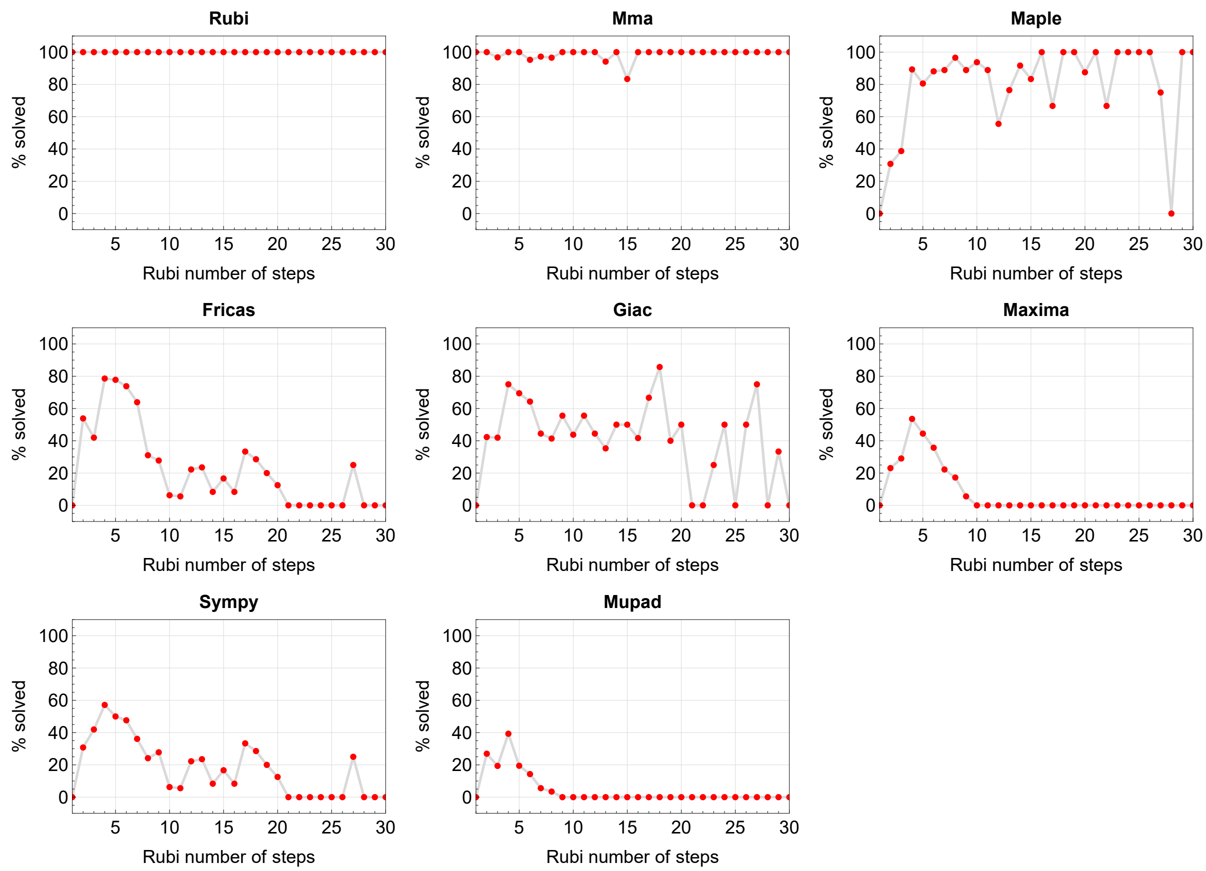


Figure 1.2: Solving statistics per number of Rubi steps used

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

1.6 Solved integrals histogram based on leaf size of result

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

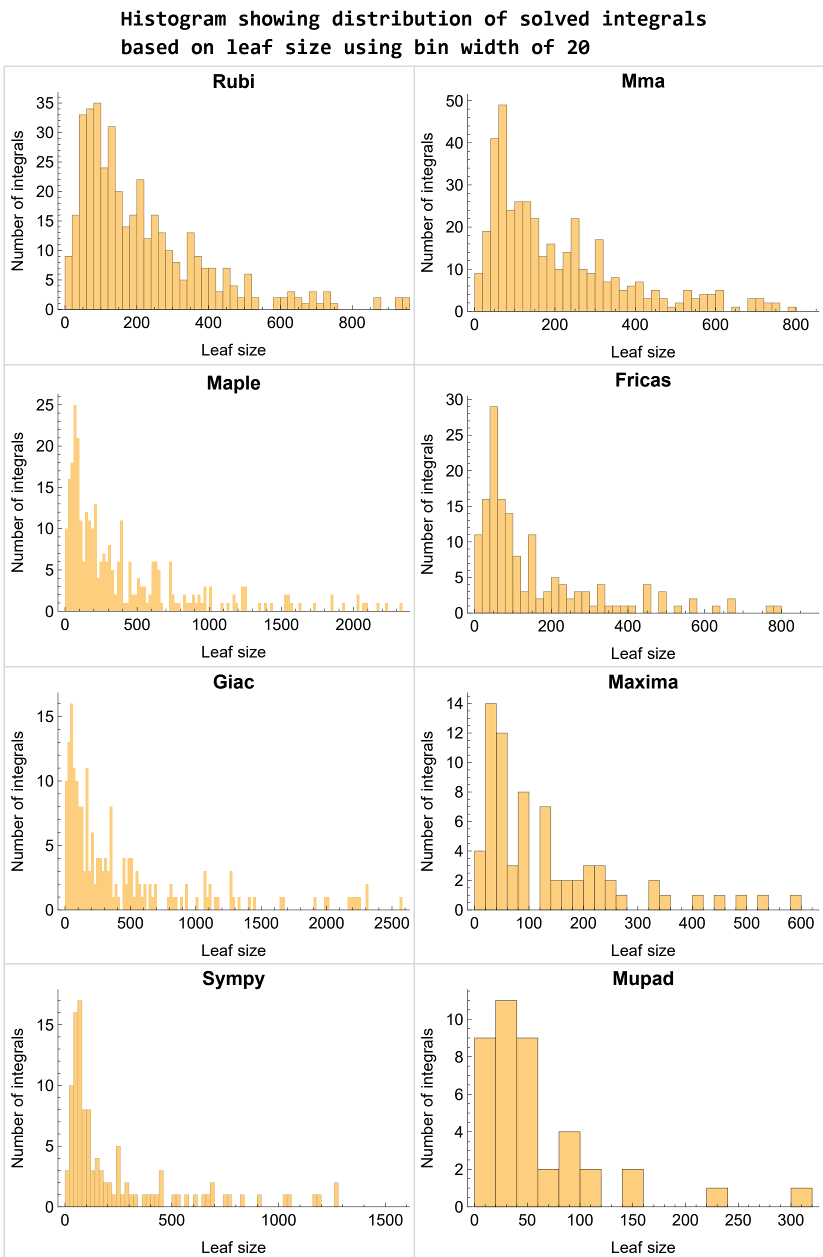


Figure 1.3: Solved integrals based on leaf size distribution

1.7 Solved integrals histogram based on CPU time used

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

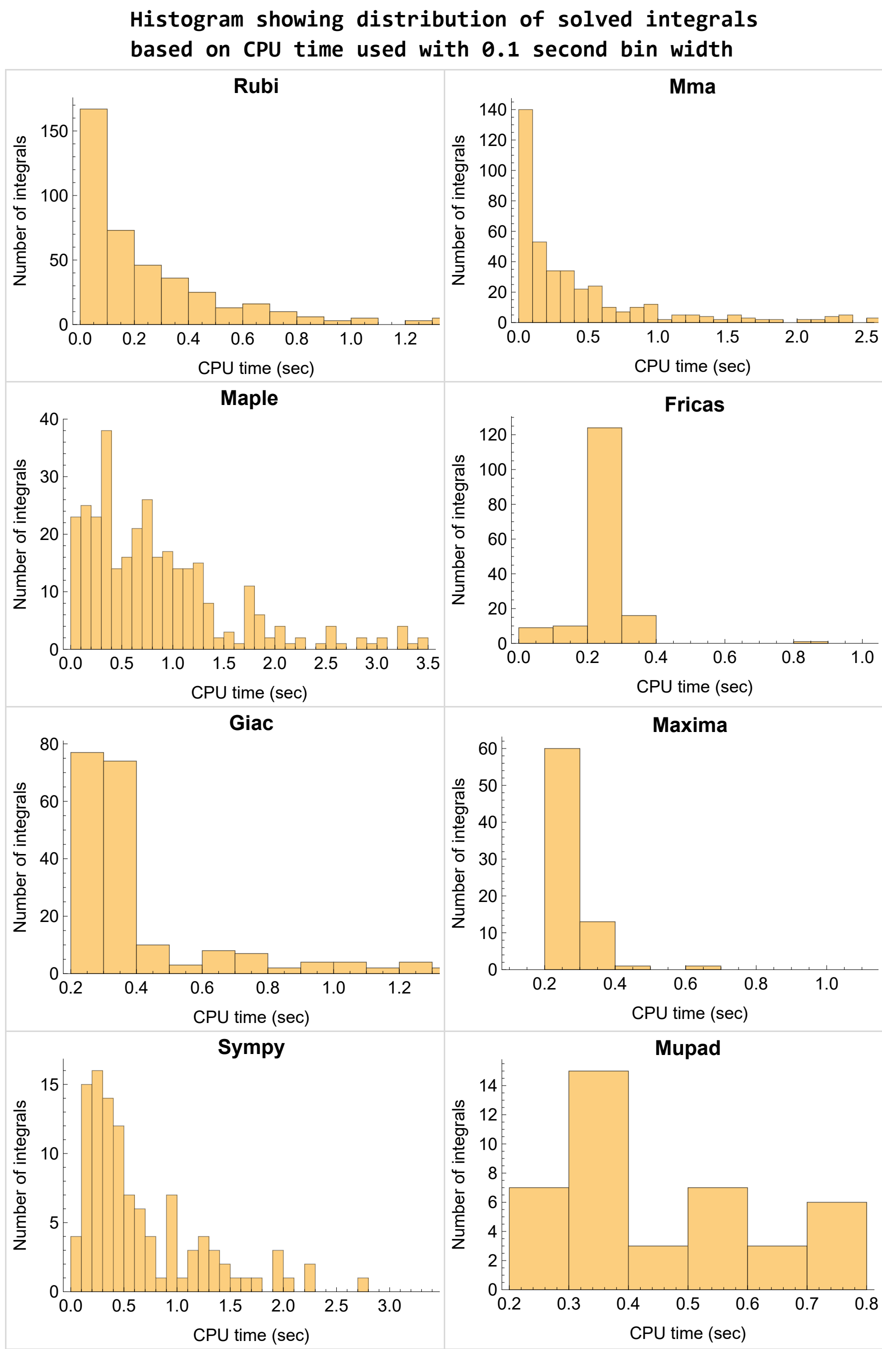


Figure 1.4: Solved integrals histogram based on CPU time used

1.8 Leaf size vs. CPU time used

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

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

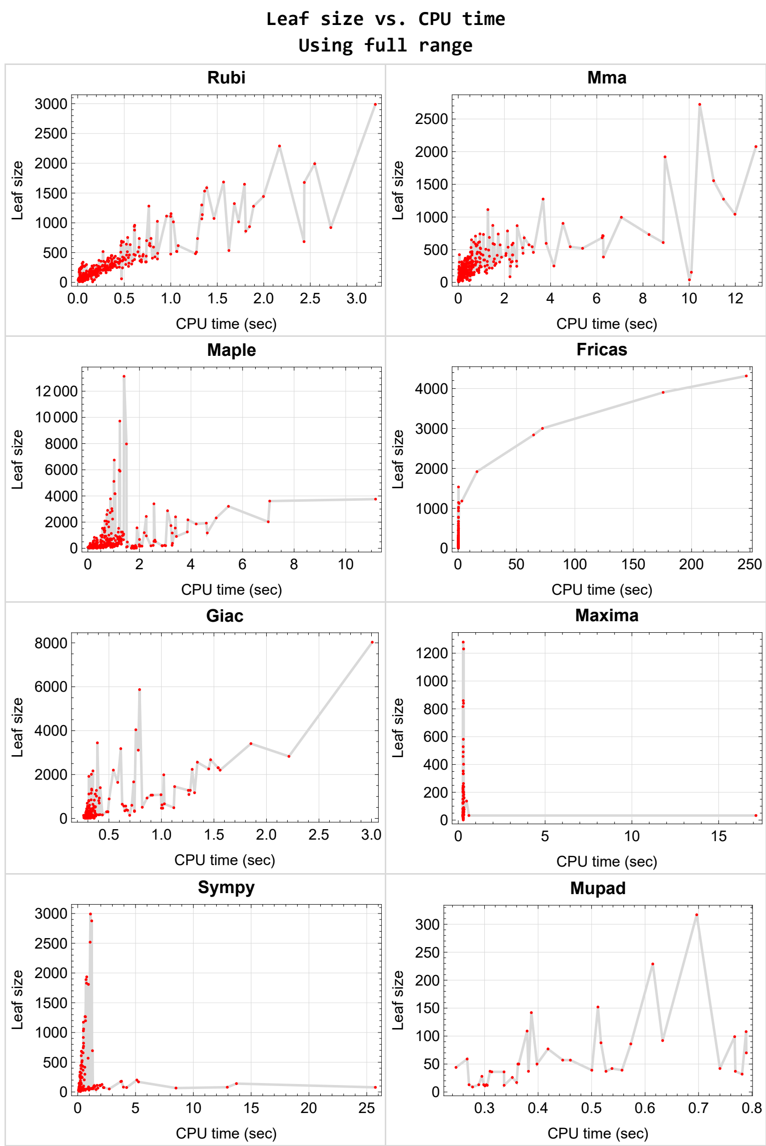


Figure 1.5: Leaf size vs. CPU time. Full range

1.9 list of integrals with no known antiderivative

{20, 21, 25, 26, 27, 29, 30, 82, 87, 146, 150, 154, 172, 176, 220, 226, 232, 238, 244, 249, 254, 258, 264, 270, 275, 280, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 312, 336, 337, 431, 435, 436, 449, 450, 455, 456, 461, 462}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {57, 78, 85, 102, 111, 112, 205, 213}

Maple {35}

Maxima Verification phase not currently implemented.

Fricas Verification phase not currently implemented.

Sympy Verification phase not currently implemented.

Giac Verification phase not currently implemented.

Mupad Verification phase not currently implemented.

1.12 Timing

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

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

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

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

1.13 Verification

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

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

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

1.14 Important notes about some of the results

Important note about Maxima results

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

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

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

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

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

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

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

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

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

Important note about FriCAS result

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

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

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

Important note about finding leaf size of antiderivative

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

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

```
def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
```

```
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)
```

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

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

  except Exception as ee:
       leafCount =1
```

Important note about Mupad results

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

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

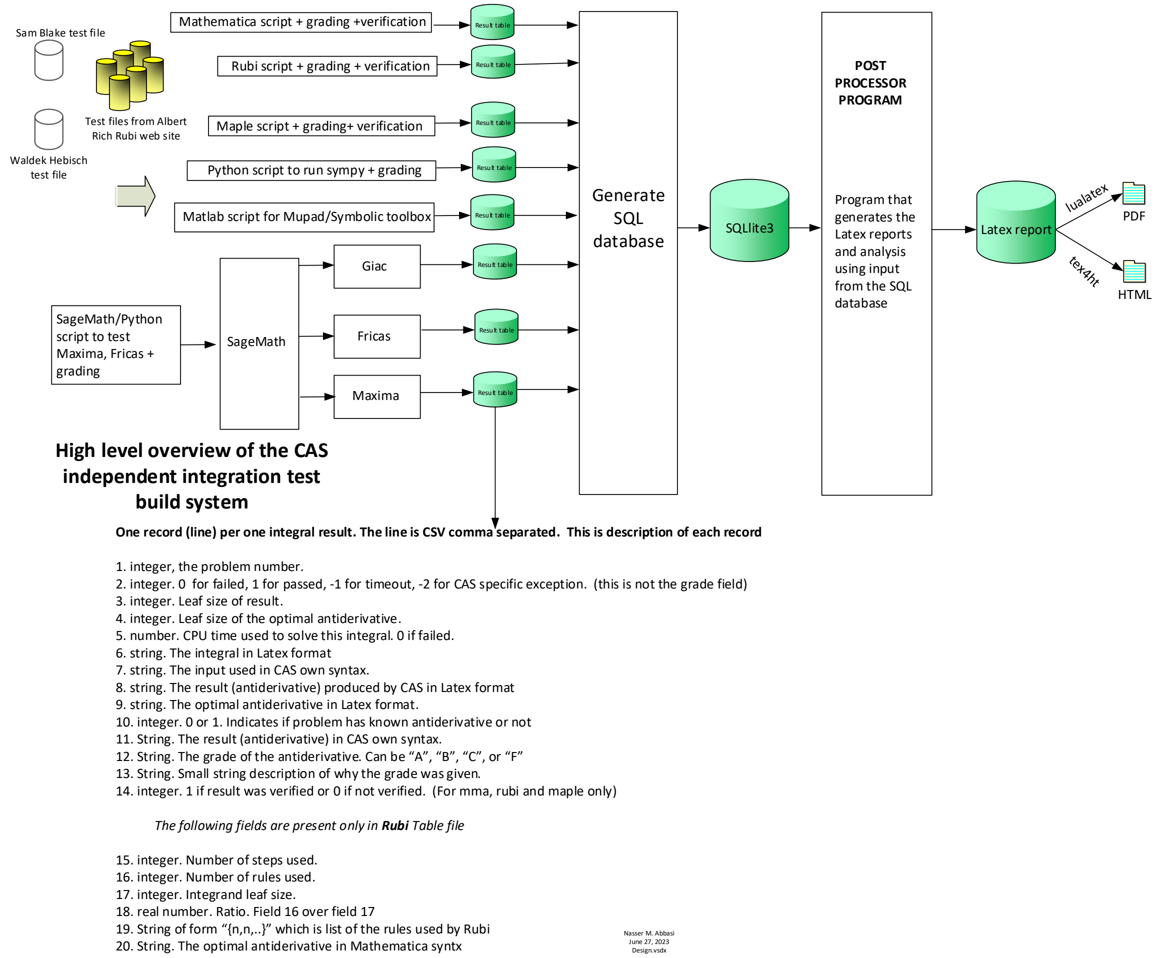
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.15 Design of the test system

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



CHAPTER 2

DETAILED SUMMARY TABLES OF RESULTS

2.1 List of integrals sorted by grade for each CAS

Rubi

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 255, 256, 257, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 432, 433, 434, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 457, 458, 459, 460, 463, 464, 465, 466, 467, 468, 469, 471, 472, 473 }

B grade { }

C grade { }

F normal fail { 470, 474 }

F(-1) timedout fail { }

F(-2) exception fail { }

Mma

A grade { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 163, 166, 168, 170, 173, 174, 175, 177, 178, 179, 180, 182, 183, 184, 185, 186, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 206, 207, 208, 209, 212, 214, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 351, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 374, 375, 376, 377, 378, 379, 380, 381, 382, 384, 385, 386, 387, 389, 390, 391, 392, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 437, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 457, 458, 459, 460, 463, 464, 465, 466, 467, 468, 470, 471, 472, 473, 474 }

B grade { 85, 125, 181, 205, 210, 211, 213, 373, 383, 388, 469 }

C grade { 7, 54, 55, 56, 102, 111, 112, 156, 157, 158, 159, 160, 161, 162, 164, 165, 167, 169, 171, 187, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 255, 256, 257, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 350, 352, 353, 354, 355, 356, 357, 358, 359, 393, 394, 395, 396, 397, 398 }

F normal fail { 28, 83, 84, 432, 433, 434, 438 }

F(-1) timedout fail { 300 }

F(-2) exception fail { }

Maple

A grade { 1, 2, 3, 4, 9, 10, 11, 12, 16, 17, 18, 19, 22, 23, 24, 34, 35, 39, 43, 47, 48, 52, 76, 77, 88, 89, 90, 97, 98, 99, 106, 107, 108, 115, 116, 117, 122, 123, 124, 125, 127, 128, 129, 131, 132, 133, 134, 136, 137, 138, 139, 140, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 156, 157, 163, 164, 165, 166, 167, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 194, 195, 196, 197, 198, 199, 200, 201, 203, 204, 205, 207, 213, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 230, 231, 237, 240, 241, 242, 243, 245, 247, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 282, 288, 290, 313, 314, 315, 316, 317, 318, 319, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 338, 339, 340, 341, 342, 343, 344, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 357, 358, 359, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 383, 387, 388, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 404, 411, 434, 437, 438, 466, 469, 473, 474 }

B grade { 5, 6, 7, 8, 14, 15, 57, 75, 79, 80, 81, 91, 92, 93, 94, 95, 96, 100, 101, 102, 103, 104, 105, 109, 110, 111, 112, 113, 120, 121, 126, 130, 158, 159, 160, 161, 162, 168, 169, 170, 171, 193, 202, 206, 208, 209, 210, 211, 212, 214, 227, 228, 229, 233, 234, 235, 236, 239, 246, 248, 250, 251, 252, 253, 255, 256, 257, 271, 272, 273, 274, 276, 277, 278, 279, 284, 286, 320, 321, 322, 335, 356, 386, 432, 433 }

C grade { 31, 32, 33, 36, 37, 38, 40, 41, 42, 44, 45, 46, 49, 50, 51, 53, 54, 55, 56, 58, 59, 60, 62, 63, 64, 66, 67, 68, 70, 71, 72, 281, 283, 285, 287, 289 }

F normal fail { 13, 28, 61, 65, 69, 73, 74, 78, 83, 84, 85, 86, 114, 118, 119, 135, 141, 142, 173, 174, 175, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 345, 360, 379, 380, 381, 382, 384, 385, 389, 400, 401, 402, 403, 405, 406, 407, 408, 409, 410, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 457, 458, 459, 460, 463, 464, 465, 467, 468, 470, 471, 472 }

F(-1) timedout fail { }

F(-2) exception fail { }

Fricas

A grade { 1, 2, 3, 4, 9, 10, 11, 12, 88, 89, 90, 97, 98, 99, 106, 107, 108, 115, 116, 117, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 138, 139, 140, 180, 181, 184, 191, 192, 195, 201, 313, 314, 315, 320, 321, 322, 327, 328, 329, 330, 331, 332, 340, 341, 342, 343, 344, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 361, 362, 363, 365, 366, 367, 368, 369, 370, 371, 372, 375, 376, 377, 378, 386, 387, 388, 390, 391, 392, 393, 394, 395, 396, 399, 400, 401, 402, 403, 404, 408, 409, 410, 411, 415, 416, 437, 439, 440, 441, 442, 451, 452, 453, 454, 463, 464, 465, 466, 470, 471, 472, 473, 474 }

B grade { 6, 7, 8, 93, 94, 95, 96, 103, 104, 177, 178, 179, 183, 185, 186, 187, 188, 189, 190, 197, 198, 199, 200, 206, 207, 208, 209, 214, 335, 373, 469 }

C grade { 281, 282, 283, 284, 285, 286, 287, 288, 289, 290 }

F normal fail { 5, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 91, 92, 100, 101, 102, 109, 110, 111, 112, 113, 114, 118, 119, 120, 121, 126, 135, 136, 137, 141, 142, 143, 144, 145, 147, 148, 149, 151, 152, 153, 173, 174, 175, 182, 193, 194, 196, 202, 203, 204, 205, 210, 211, 212, 213, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 316, 317, 318, 319, 323, 324, 325, 326, 333, 334, 338, 339, 345, 357, 358, 359, 360, 364, 374, 389, 397, 398, 405, 406, 407, 412, 413, 414, 432, 433, 434, 443, 444, 445, 446, 447, 448, 457, 458, 459, 460, 467, 468 }

F(-1) timedout fail { 105 }

F(-2) exception fail { 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 379, 380, 381, 382, 383, 384, 385, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 438 }

Maxima

A grade { 1, 2, 3, 4, 12, 46, 72, 88, 89, 90, 97, 98, 99, 106, 107, 108, 125, 181, 333, 340, 341, 342, 343, 344, 346, 347, 348, 349, 350, 351, 361, 362, 363, 365, 366, 367, 368, 369, 370, 371, 372, 373, 375, 376, 377, 378, 387, 388, 399, 400, 404, 411, 437, 466, 470, 473 }

B grade { 122, 123, 124, 177, 178, 179, 180, 184, 186, 195, 315, 322, 328, 329, 331, 332, 335, 338, 339, 386 }

C grade { }

F normal fail { 5, 8, 9, 10, 11, 13, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 36, 37, 38, 40, 41, 42, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64, 66, 67, 68, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 91, 94, 95, 96, 100, 103, 104, 105, 109, 112, 115, 116, 117, 118, 126, 131, 132, 133, 134, 135, 138, 139, 140, 141, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 182, 185, 187, 188, 189, 190, 191, 192, 193, 196, 197, 198, 199, 200, 201, 202, 205, 206, 207, 208, 209, 210, 213, 214, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 255, 256, 257, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 310, 311, 313, 314, 316, 317, 318, 320, 321, 323, 324, 325, 330, 334, 345, 352, 353, 354, 355, 356, 357, 358, 359, 360, 364, 374, 379, 380, 381, 382, 383, 384, 385, 389, 408, 409, 410, 412, 413, 414, 416, 424, 425, 426, 427, 428, 429, 430, 432, 433, 434, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 457, 458, 459, 460, 463, 464, 465, 467, 468, 469, 474 }

F(-1) timedout fail { 204, 212, 233, 234, 235, 236, 237, 238, 239, 319, 326 }

F(-2) exception fail { 6, 7, 14, 15, 34, 35, 39, 43, 61, 65, 69, 92, 93, 101, 102, 110, 111, 113, 114, 119, 120, 121, 127, 128, 129, 130, 136, 137, 142, 183, 194, 203, 211, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 327, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 405, 406, 407, 415, 417, 418, 419, 420, 421, 422, 423, 471, 472 }

Giac

A grade { 1, 2, 3, 4, 11, 12, 16, 17, 18, 19, 90, 124, 125, 127, 131, 132, 133, 134, 138, 139, 140, 143, 144, 145, 148, 149, 151, 152, 153, 177, 178, 179, 180, 181, 191, 192, 217, 218, 219, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 335, 340, 341, 342, 343, 344, 361, 362, 363, 365, 375, 376, 377, 378, 387, 388, 399, 400, 404, 411, 416, 437, 439, 440, 441, 442, 451, 452, 453, 454, 466, 473, 474 }

B grade { 6, 9, 10, 22, 23, 24, 88, 89, 97, 98, 99, 106, 107, 108, 115, 116, 117, 122, 123, 128, 129, 130, 147, 183, 184, 185, 186, 187, 188, 189, 190, 195, 197, 198, 199, 200, 201, 206, 207, 208, 209, 214, 215, 216, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 346, 347, 348, 349, 350, 351, 366, 367, 368, 369, 370, 371, 372, 373, 386, 401, 402, 403, 408, 409, 410, 469 }

C grade { 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 255, 256, 257, 259, 260, 261, 262, 263 }

F normal fail { 5, 7, 8, 13, 14, 15, 28, 44, 45, 46, 70, 71, 72, 83, 84, 85, 86, 91, 92, 93, 94, 96, 100, 101, 102, 103, 105, 109, 110, 111, 112, 113, 114, 118, 119, 120, 121, 126, 135, 136, 137, 141, 142, 166, 167, 168, 169, 170, 171, 173, 174, 175, 182, 193, 194, 196, 202, 203, 204, 205, 210, 211, 212, 213, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 333, 334, 338, 339, 345, 352, 353, 354, 355, 356, 357, 358, 359, 360, 364, 379, 380, 381, 382, 383, 384, 385, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 405, 406, 407, 412, 413, 414, 415, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 432, 433, 434, 438, 443, 444, 445, 446, 447, 448, 457, 458, 459, 460, 467, 468, 470, 471, 472 }

F(-1) timedout fail { 172 }

F(-2) exception fail { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 73, 74, 75, 76, 77, 78, 79, 80, 81, 95, 104, 374, 463, 464, 465 }

Mupad

A grade { }

B grade { 3, 4, 12, 125, 134, 140, 181, 192, 201, 209, 214, 327, 328, 329, 330, 331, 332, 343, 344, 345, 346, 360, 363, 364, 372, 373, 374, 375, 376, 388, 399, 400, 404, 411, 437, 438, 466, 469, 472, 473, 474 }

C grade { }

F normal fail { }

F(-1) timedout fail { 1, 2, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 137, 138, 139, 141, 142, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 177, 178, 179, 180, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 193, 194, 195, 196, 197, 198, 199, 200, 202, 203, 204, 205, 206, 207, 208, 210, 211, 212, 213, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 255, 256, 257, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 333, 334, 335, 338, 339, 340, 341, 342, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 361, 362, 365, 366, 367, 368, 369, 370, 371, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 405, 406, 407, 408, 409, 410, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 432, 433, 434, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 457, 458, 459, 460, 463, 464, 465, 467, 468, 470, 471 }

F(-2) exception fail { }

Sympy

A grade { 1, 2, 3, 4, 10, 11, 12, 90, 124, 125, 131, 132, 133, 134, 138, 139, 140, 181, 340, 341, 342, 343, 344, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 361, 362, 363, 366, 367, 368, 369, 370, 371, 372, 373, 375, 376, 377, 378, 386, 387, 388, 399, 437, 439, 440, 441, 442, 451, 452, 453, 454, 463, 464, 465, 466, 473 }

B grade { 9, 88, 89, 97, 98, 99, 106, 107, 108, 115, 116, 117, 122, 123, 177, 178, 179, 180, 188, 189, 190, 191, 192, 197, 198, 199, 200, 201, 206, 207, 208, 209, 214, 320, 321, 322, 327, 328, 329, 330, 331, 332, 400 }

C grade { 365, 380, 381, 382, 384, 385 }

F normal fail { 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 38, 39, 43, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 64, 65, 69, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 91, 92, 93, 94, 95, 96, 100, 101, 102, 103, 104, 105, 109, 110, 111, 112, 113, 114, 118, 119, 120, 121, 126, 127, 128, 129, 130, 135, 136, 137, 141, 142, 143, 144, 145, 147, 148, 149, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 163, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 182, 183, 184, 185, 186, 187, 193, 194, 195, 196, 202, 203, 204, 205, 210, 211, 212, 213, 215, 216, 217, 218, 219, 221, 222, 223, 224, 225, 227, 228, 229, 230, 231, 233, 234, 235, 236, 237, 239, 240, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 253, 259, 260, 261, 262, 263, 265, 266, 267, 268, 269, 271, 272, 273, 274, 276, 277, 278, 279, 283, 284, 286, 287, 288, 293, 294, 296, 297, 298, 310, 311, 313, 314, 315, 316, 317, 318, 319, 323, 324, 325, 326, 333, 334, 335, 345, 360, 364, 374, 379, 383, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 438, 443, 444, 445, 446, 447, 448, 457, 458, 459, 460, 467, 468, 469, 470, 471, 472, 474 }

F(-1) timedout fail { 36, 37, 40, 41, 42, 62, 63, 66, 67, 68, 82, 162, 255, 256, 257, 258, 281, 282, 289, 290, 291, 292, 299, 338, 339, 431, 432, 433, 434, 436 }

F(-2) exception fail { 44, 45, 46, 70, 71, 72, 285, 295, 301, 305 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	165	248	231	201	316	317	0
N.S.	1	1.00	0.92	1.39	1.29	1.12	1.77	1.77	0.00
time (sec)	N/A	0.120	0.108	0.220	0.266	0.258	0.310	0.295	0.000

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	121	178	150	135	190	194	0
N.S.	1	1.00	0.98	1.44	1.21	1.09	1.53	1.56	0.00
time (sec)	N/A	0.067	0.077	0.230	0.267	0.259	0.237	0.283	0.000

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	92	86	81	76	99	98	77
N.S.	1	1.00	0.94	0.88	0.83	0.78	1.01	1.00	0.79
time (sec)	N/A	0.038	0.028	0.016	0.268	0.251	0.172	0.279	0.419

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	30	30	30	30	29	31	26	29	28
N.S.	1	1.00	1.00	1.00	0.97	1.03	0.87	0.97	0.93
time (sec)	N/A	0.010	0.008	0.043	0.266	0.243	0.069	0.269	0.295

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	214	758	0	0	0	0	0
N.S.	1	1.00	0.93	3.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.200	0.133	1.005	0.000	0.000	0.000	0.000	0.000

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	83	187	0	371	0	200	0
N.S.	1	1.00	0.98	2.20	0.00	4.36	0.00	2.35	0.00
time (sec)	N/A	0.037	0.101	1.010	0.000	0.280	0.000	0.313	0.000

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	207	295	0	673	0	0	0
N.S.	1	1.00	1.53	2.19	0.00	4.99	0.00	0.00	0.00
time (sec)	N/A	0.059	0.288	0.326	0.000	0.354	0.000	0.000	0.000

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	241	554	0	1125	0	0	0
N.S.	1	1.00	1.26	2.90	0.00	5.89	0.00	0.00	0.00
time (sec)	N/A	0.095	0.361	0.211	0.000	0.860	0.000	0.000	0.000

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	374	374	355	541	0	446	743	816	0
N.S.	1	1.00	0.95	1.45	0.00	1.19	1.99	2.18	0.00
time (sec)	N/A	0.487	0.351	0.568	0.000	0.275	0.478	0.308	0.000

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	242	249	374	0	290	454	487	0
N.S.	1	1.00	1.03	1.55	0.00	1.20	1.88	2.01	0.00
time (sec)	N/A	0.332	0.239	0.316	0.000	0.273	0.320	0.308	0.000

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	154	189	0	156	233	244	0
N.S.	1	1.00	1.08	1.33	0.00	1.10	1.64	1.72	0.00
time (sec)	N/A	0.203	0.695	0.197	0.000	0.243	0.246	0.284	0.000

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	72	72	65	82	75	142
N.S.	1	1.00	1.00	1.53	1.53	1.38	1.74	1.60	3.02
time (sec)	N/A	0.040	0.030	0.000	0.275	0.254	0.102	0.273	0.387

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	347	347	332	0	0	0	0	0	0
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.330	0.263	0.000	0.000	0.000	0.000	0.000	0.000

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	309	309	231	642	0	0	0	0	0
N.S.	1	1.00	0.75	2.08	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.360	0.273	0.780	0.000	0.000	0.000	0.000	0.000

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	401	401	315	966	0	0	0	0	0
N.S.	1	1.00	0.79	2.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.432	0.826	1.338	0.000	0.000	0.000	0.000	0.000

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	393	393	304	327	0	0	0	609	0
N.S.	1	1.00	0.77	0.83	0.00	0.00	0.00	1.55	0.00
time (sec)	N/A	0.857	0.606	0.214	0.000	0.000	0.000	0.316	0.000

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	244	244	187	206	0	0	0	337	0
N.S.	1	1.00	0.77	0.84	0.00	0.00	0.00	1.38	0.00
time (sec)	N/A	0.481	0.402	0.204	0.000	0.000	0.000	0.313	0.000

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	98	103	0	0	0	139	0
N.S.	1	1.00	0.85	0.90	0.00	0.00	0.00	1.21	0.00
time (sec)	N/A	0.222	0.169	0.080	0.000	0.000	0.000	0.303	0.000

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	44	48	0	0	0	49	0
N.S.	1	1.00	0.83	0.91	0.00	0.00	0.00	0.92	0.00
time (sec)	N/A	0.041	0.013	0.011	0.000	0.000	0.000	0.297	0.000

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	25	15	20	20
N.S.	1	1.00	1.11	1.00	1.11	1.39	0.83	1.11	1.11
time (sec)	N/A	0.022	0.196	3.372	0.348	0.251	0.904	0.337	0.232

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	49	17	20	20
N.S.	1	1.00	1.11	1.00	1.11	2.72	0.94	1.11	1.11
time (sec)	N/A	0.020	0.338	1.359	0.358	0.253	1.782	0.823	0.249

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	362	362	290	526	0	0	0	1276	0
N.S.	1	1.00	0.80	1.45	0.00	0.00	0.00	3.52	0.00
time (sec)	N/A	0.335	1.634	0.355	0.000	0.000	0.000	0.381	0.000

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	181	149	257	0	0	0	554	0
N.S.	1	1.00	0.82	1.42	0.00	0.00	0.00	3.06	0.00
time (sec)	N/A	0.186	0.893	0.154	0.000	0.000	0.000	0.359	0.000

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	72	76	0	0	0	192	0
N.S.	1	1.00	0.84	0.88	0.00	0.00	0.00	2.23	0.00
time (sec)	N/A	0.103	0.179	0.014	0.000	0.000	0.000	0.311	0.000

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	297	51	17	20	20
N.S.	1	1.00	1.11	1.00	16.50	2.83	0.94	1.11	1.11
time (sec)	N/A	0.020	10.233	5.662	1.603	0.245	1.668	0.398	0.237

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	426	92	19	20	20
N.S.	1	1.00	1.11	1.00	23.67	5.11	1.06	1.11	1.11
time (sec)	N/A	0.018	12.804	1.961	2.601	0.249	6.159	0.965	0.224

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	227	32	17	20	20
N.S.	1	1.00	1.11	1.00	12.61	1.78	0.94	1.11	1.11
time (sec)	N/A	0.133	11.395	0.236	1.682	0.264	14.916	0.420	0.386

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	154	154	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	20	15	20	20
N.S.	1	1.00	1.11	1.00	1.11	1.11	0.83	1.11	1.11
time (sec)	N/A	0.020	0.353	2.317	0.368	0.242	0.952	0.363	0.229

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	237	34	17	20	20
N.S.	1	1.00	1.11	1.00	13.17	1.89	0.94	1.11	1.11
time (sec)	N/A	0.018	0.732	1.448	1.793	0.260	15.553	0.455	0.249

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	669	669	356	1396	0	0	0	0	0
N.S.	1	1.00	0.53	2.09	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.473	0.331	0.625	0.000	0.000	0.000	0.000	0.000

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	450	450	237	973	0	0	0	0	0
N.S.	1	1.00	0.53	2.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.362	0.409	0.499	0.000	0.000	0.000	0.000	0.000

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	132	628	0	0	0	0	0
N.S.	1	1.00	0.55	2.64	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.164	0.178	0.499	0.000	0.000	0.000	0.000	0.000

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	736	736	368	823	0	0	0	0	0
N.S.	1	1.00	0.50	1.12	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.288	0.746	0.647	0.000	0.000	0.000	0.000	0.000

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	860	860	600	1352	0	0	0	0	0
N.S.	1	1.00	0.70	1.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.806	2.373	0.661	0.000	0.000	0.000	0.000	0.000

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	959	959	463	2074	0	0	0	0	0
N.S.	1	1.00	0.48	2.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.612	0.831	0.721	0.000	0.000	0.000	0.000	0.000

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	680	680	332	1535	0	0	0	0	0
N.S.	1	1.00	0.49	2.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.491	0.356	0.565	0.000	0.000	0.000	0.000	0.000

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	370	370	216	1014	0	0	0	0	0
N.S.	1	1.00	0.58	2.74	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.228	0.219	0.557	0.000	0.000	0.000	0.000	0.000

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1073	1073	507	1546	0	0	0	0	0
N.S.	1	1.00	0.47	1.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.465	1.192	0.643	0.000	0.000	0.000	0.000	0.000

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1281	1281	587	2903	0	0	0	0	0
N.S.	1	1.00	0.46	2.27	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.765	0.745	0.766	0.000	0.000	0.000	0.000	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	940	940	390	2090	0	0	0	0	0
N.S.	1	1.00	0.41	2.22	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.608	0.523	0.657	0.000	0.000	0.000	0.000	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	517	517	251	1423	0	0	0	0	0
N.S.	1	1.00	0.49	2.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.272	0.292	0.627	0.000	0.000	0.000	0.000	0.000

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1648	1648	787	2580	0	0	0	0	0
N.S.	1	1.00	0.48	1.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.793	2.131	0.734	0.000	0.000	0.000	0.000	0.000

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	450	450	343	856	0	0	0	0	0
N.S.	1	1.00	0.76	1.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.367	1.139	0.546	0.000	0.000	0.000	0.000	0.000

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	266	505	0	0	0	0	0
N.S.	1	1.00	0.99	1.87	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.261	0.661	0.497	0.000	0.000	0.000	0.000	0.000

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	172	247	90	0	0	0	0
N.S.	1	1.00	1.37	1.96	0.71	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.264	0.472	0.310	0.000	0.000	0.000	0.000

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	232	508	0	0	0	0	0
N.S.	1	1.00	0.61	1.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.367	0.159	0.494	0.000	0.000	0.000	0.000	0.000

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	507	507	295	932	0	0	0	0	0
N.S.	1	1.00	0.58	1.84	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.463	0.372	0.654	0.000	0.000	0.000	0.000	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	315	315	194	724	0	0	0	0	0
N.S.	1	1.00	0.62	2.30	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.373	0.814	0.860	0.000	0.000	0.000	0.000	0.000

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	213	213	156	488	0	0	0	0	0
N.S.	1	1.00	0.73	2.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.299	0.555	0.781	0.000	0.000	0.000	0.000	0.000

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	135	305	0	0	0	0	0
N.S.	1	1.00	0.94	2.12	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.124	0.419	0.867	0.000	0.000	0.000	0.000	0.000

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	654	654	359	1094	0	0	0	0	0
N.S.	1	1.00	0.55	1.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.774	1.564	1.388	0.000	0.000	0.000	0.000	0.000

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	528	754	868	6743	0	0	0	0	0
N.S.	1	1.43	1.64	12.77	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.537	2.548	1.023	0.000	0.000	0.000	0.000	0.000

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	410	410	366	5114	0	0	0	0	0
N.S.	1	1.00	0.89	12.47	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.326	0.946	1.009	0.000	0.000	0.000	0.000	0.000

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	354	285	3783	0	0	0	0	0
N.S.	1	1.31	1.05	13.96	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.278	0.754	0.877	0.000	0.000	0.000	0.000	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	228	228	208	2237	0	0	0	0	0
N.S.	1	1.00	0.91	9.81	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.139	0.571	0.959	0.000	0.000	0.000	0.000	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	1300	1300	2078	7971	0	0	0	0	0
N.S.	1	1.00	1.60	6.13	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.333	12.894	1.497	0.000	0.000	0.000	0.000	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1154	1154	708	2728	0	0	0	0	0
N.S.	1	1.00	0.61	2.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.003	0.744	0.865	0.000	0.000	0.000	0.000	0.000

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	737	737	441	1852	0	0	0	0	0
N.S.	1	1.00	0.60	2.51	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.662	0.595	0.728	0.000	0.000	0.000	0.000	0.000

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	396	396	225	1236	0	0	0	0	0
N.S.	1	1.00	0.57	3.12	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.324	0.176	0.646	0.000	0.000	0.000	0.000	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1442	1442	516	0	0	0	0	0	0
N.S.	1	1.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.997	0.967	0.000	0.000	0.000	0.000	0.000	0.000

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1685	1685	872	4176	0	0	0	0	0
N.S.	1	1.00	0.52	2.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.568	1.495	1.046	0.000	0.000	0.000	0.000	0.000

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1108	1108	616	3032	0	0	0	0	0
N.S.	1	1.00	0.56	2.74	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.999	0.667	0.928	0.000	0.000	0.000	0.000	0.000

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	621	621	395	2021	0	0	0	0	0
N.S.	1	1.00	0.64	3.25	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.464	0.418	0.799	0.000	0.000	0.000	0.000	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1992	1992	740	0	0	0	0	0	0
N.S.	1	1.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.547	1.730	0.000	0.000	0.000	0.000	0.000	0.000

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	2290	2290	1114	5977	0	0	0	0	0
N.S.	1	1.00	0.49	2.61	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.169	1.282	1.215	0.000	0.000	0.000	0.000	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1533	1533	742	4170	0	0	0	0	0
N.S.	1	1.00	0.48	2.72	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.364	0.940	1.055	0.000	0.000	0.000	0.000	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	878	878	470	2852	0	0	0	0	0
N.S.	1	1.00	0.54	3.25	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.611	0.594	0.941	0.000	0.000	0.000	0.000	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	2989	2989	1275	0	0	0	0	0	0
N.S.	1	1.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	3.199	3.674	0.000	0.000	0.000	0.000	0.000	0.000

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	692	692	582	1636	0	0	0	0	0
N.S.	1	1.00	0.84	2.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.471	1.565	0.810	0.000	0.000	0.000	0.000	0.000

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	410	410	400	928	0	0	0	0	0
N.S.	1	1.00	0.98	2.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.353	1.348	0.700	0.000	0.000	0.000	0.000	0.000

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	207	118	460	184	0	0	0	0
N.S.	1	1.21	0.69	2.69	1.08	0.00	0.00	0.00	0.00
time (sec)	N/A	0.240	0.677	0.639	0.313	0.000	0.000	0.000	0.000

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	589	589	357	0	0	0	0	0	0
N.S.	1	1.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.658	0.294	0.000	0.000	0.000	0.000	0.000	0.000

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1113	1113	651	0	0	0	0	0	0
N.S.	1	1.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.955	0.573	0.000	0.000	0.000	0.000	0.000	0.000

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	738	738	325	1528	0	0	0	0	0
N.S.	1	1.00	0.44	2.07	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.788	2.523	1.193	0.000	0.000	0.000	0.000	0.000

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	513	513	259	975	0	0	0	0	0
N.S.	1	1.00	0.50	1.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.647	1.583	1.075	0.000	0.000	0.000	0.000	0.000

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	410	410	237	612	0	0	0	0	0
N.S.	1	1.00	0.58	1.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.387	0.999	1.204	0.000	0.000	0.000	0.000	0.000

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	1137	1137	597	0	0	0	0	0	0
N.S.	1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.339	3.807	0.000	0.000	0.000	0.000	0.000	0.000

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1589	1589	715	13140	0	0	0	0	0
N.S.	1	1.00	0.45	8.27	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.387	6.256	1.402	0.000	0.000	0.000	0.000	0.000

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1025	1025	711	9720	0	0	0	0	0
N.S.	1	1.00	0.69	9.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.856	6.275	1.239	0.000	0.000	0.000	0.000	0.000

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	641	641	683	5894	0	0	0	0	0
N.S.	1	1.00	1.07	9.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.523	6.232	1.248	0.000	0.000	0.000	0.000	0.000

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	35	37	33	35	47	0	35	35
N.S.	1	1.00	1.06	0.94	1.00	1.34	0.00	1.00	1.00
time (sec)	N/A	0.126	0.167	7.071	1.933	0.260	0.000	0.425	0.254

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	634	634	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.565	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	514	514	0	0	0	0	0	0	0
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.534	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	390	390	2724	0	0	0	0	0	0
N.S.	1	1.00	6.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.450	10.459	0.000	0.000	0.000	0.000	0.000	0.000

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	237	237	246	0	0	0	0	0	0
N.S.	1	1.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.238	0.034	0.000	0.000	0.000	0.000	0.000	0.000

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	35	37	33	35	57	34	35	35
N.S.	1	1.00	1.06	0.94	1.00	1.63	0.97	1.00	1.00
time (sec)	N/A	0.138	0.420	12.391	1.011	0.241	9.436	0.419	0.241

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	305	445	528	441	770	784	0
N.S.	1	1.00	0.87	1.27	1.50	1.26	2.19	2.23	0.00
time (sec)	N/A	0.686	0.421	0.197	0.282	0.269	0.505	0.308	0.000

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	248	248	211	304	353	295	502	491	0
N.S.	1	1.00	0.85	1.23	1.42	1.19	2.02	1.98	0.00
time (sec)	N/A	0.356	0.323	0.198	0.281	0.269	0.357	0.309	0.000

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	138	178	199	161	267	259	0
N.S.	1	1.00	0.93	1.20	1.34	1.09	1.80	1.75	0.00
time (sec)	N/A	0.135	0.203	0.080	0.279	0.255	0.246	0.308	0.000

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	344	344	322	1566	0	0	0	0	0
N.S.	1	1.00	0.94	4.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.452	0.593	1.905	0.000	0.000	0.000	0.000	0.000

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	358	358	334	954	0	0	0	0	0
N.S.	1	1.00	0.93	2.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.677	0.587	2.267	0.000	0.000	0.000	0.000	0.000

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	263	535	0	1184	0	0	0
N.S.	1	1.00	1.30	2.65	0.00	5.86	0.00	0.00	0.00
time (sec)	N/A	0.234	0.739	2.562	0.000	3.243	0.000	0.000	0.000

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	257	257	321	908	0	1920	0	0	0
N.S.	1	1.00	1.25	3.53	0.00	7.47	0.00	0.00	0.00
time (sec)	N/A	0.301	0.757	3.434	0.000	16.148	0.000	0.000	0.000

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	360	360	418	1550	0	2839	0	0	0
N.S.	1	1.00	1.16	4.31	0.00	7.89	0.00	0.00	0.00
time (sec)	N/A	0.478	1.069	3.389	0.000	64.657	0.000	0.000	0.000

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	457	457	494	2406	0	3904	0	0	0
N.S.	1	1.00	1.08	5.26	0.00	8.54	0.00	0.00	0.00
time (sec)	N/A	0.619	1.314	3.401	0.000	175.625	0.000	0.000	0.000

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	512	509	463	633	859	676	1263	1337	0
N.S.	1	0.99	0.90	1.24	1.68	1.32	2.47	2.61	0.00
time (sec)	N/A	1.276	0.527	0.366	0.287	0.288	0.670	0.335	0.000

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	307	449	581	449	821	847	0
N.S.	1	1.00	0.85	1.24	1.61	1.24	2.27	2.35	0.00
time (sec)	N/A	0.670	0.519	0.375	0.291	0.275	0.506	0.331	0.000

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	223	223	186	273	334	245	449	448	0
N.S.	1	1.00	0.83	1.22	1.50	1.10	2.01	2.01	0.00
time (sec)	N/A	0.293	0.298	0.315	0.292	0.262	0.341	0.295	0.000

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	459	459	457	2438	0	0	0	0	0
N.S.	1	1.00	1.00	5.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.526	0.929	2.265	0.000	0.000	0.000	0.000	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	460	460	432	1859	0	0	0	0	0
N.S.	1	1.00	0.94	4.04	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.556	0.990	4.202	0.000	0.000	0.000	0.000	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	488	488	996	2027	0	0	0	0	0
N.S.	1	1.00	2.04	4.15	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.859	7.064	6.997	0.000	0.000	0.000	0.000	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	349	349	442	1177	0	3003	0	0	0
N.S.	1	1.00	1.27	3.37	0.00	8.60	0.00	0.00	0.00
time (sec)	N/A	0.401	2.069	4.631	0.000	72.257	0.000	0.000	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	470	470	575	1924	0	4316	0	0	0
N.S.	1	1.00	1.22	4.09	0.00	9.18	0.00	0.00	0.00
time (sec)	N/A	0.603	3.062	4.595	0.000	246.845	0.000	0.000	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	593	593	682	3208	0	0	0	0	0
N.S.	1	1.00	1.15	5.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.815	2.856	5.453	0.000	0.000	0.000	0.000	0.000

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	684	684	619	836	1231	936	1809	2010	0
N.S.	1	1.00	0.90	1.22	1.80	1.37	2.64	2.94	0.00
time (sec)	N/A	2.433	0.919	0.250	0.307	0.314	0.928	0.333	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	484	482	380	602	840	621	1197	1287	0
N.S.	1	1.00	0.79	1.24	1.74	1.28	2.47	2.66	0.00
time (sec)	N/A	1.266	0.913	0.251	0.302	0.294	0.676	0.337	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	308	308	253	380	490	341	658	692	0
N.S.	1	1.00	0.82	1.23	1.59	1.11	2.14	2.25	0.00
time (sec)	N/A	0.580	0.471	0.088	0.285	0.285	0.465	0.294	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	623	623	610	3401	0	0	0	0	0
N.S.	1	1.00	0.98	5.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.770	0.872	2.562	0.000	0.000	0.000	0.000	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	617	617	593	2873	0	0	0	0	0
N.S.	1	1.00	0.96	4.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.080	1.503	3.090	0.000	0.000	0.000	0.000	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	1016	1016	1556	3610	0	0	0	0	0
N.S.	1	1.00	1.53	3.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.730	11.060	7.053	0.000	0.000	0.000	0.000	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	1278	1278	1921	3757	0	0	0	0	0
N.S.	1	1.00	1.50	2.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.890	8.955	11.160	0.000	0.000	0.000	0.000	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	935	935	574	2321	0	0	0	0	0
N.S.	1	1.00	0.61	2.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.847	1.812	4.978	0.000	0.000	0.000	0.000	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1678	1678	903	0	0	0	0	0	0
N.S.	1	1.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.436	4.536	0.000	0.000	0.000	0.000	0.000	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1016	1016	734	1734	0	1537	2992	3444	0
N.S.	1	1.00	0.72	1.71	0.00	1.51	2.94	3.39	0.00
time (sec)	N/A	1.029	1.089	3.223	0.000	0.327	1.105	0.390	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	701	701	534	1194	0	1029	1935	2166	0
N.S.	1	1.00	0.76	1.70	0.00	1.47	2.76	3.09	0.00
time (sec)	N/A	0.740	0.551	2.186	0.000	0.315	0.781	0.348	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	425	425	364	679	0	579	1059	1145	0
N.S.	1	1.00	0.86	1.60	0.00	1.36	2.49	2.69	0.00
time (sec)	N/A	0.482	0.357	2.003	0.000	0.290	0.511	0.331	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1067	1067	556	0	0	0	0	0	0
N.S.	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.334	0.779	0.000	0.000	0.000	0.000	0.000	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1323	1323	688	0	0	0	0	0	0
N.S.	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.684	1.346	0.000	0.000	0.000	0.000	0.000	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	520	520	307	1251	0	0	0	0	0
N.S.	1	1.00	0.59	2.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.063	0.517	3.857	0.000	0.000	0.000	0.000	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	920	920	526	2174	0	0	0	0	0
N.S.	1	1.00	0.57	2.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.721	0.952	3.881	0.000	0.000	0.000	0.000	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	99	213	333	93	255	284	0
N.S.	1	1.00	0.72	1.55	2.43	0.68	1.86	2.07	0.00
time (sec)	N/A	0.143	0.101	0.068	0.284	0.258	0.328	0.299	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	77	137	220	74	170	173	0
N.S.	1	1.00	0.82	1.46	2.34	0.79	1.81	1.84	0.00
time (sec)	N/A	0.089	0.073	0.045	0.272	0.253	0.238	0.292	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	62	79	153	58	104	91	0
N.S.	1	1.00	0.78	0.99	1.91	0.72	1.30	1.14	0.00
time (sec)	N/A	0.054	0.058	0.053	0.274	0.261	0.184	0.289	0.000

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	154	31	30	39	46	30	86
N.S.	1	1.00	4.40	0.89	0.86	1.11	1.31	0.86	2.46
time (sec)	N/A	0.012	0.359	0.040	0.264	0.265	0.087	0.274	0.573

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	181	197	579	0	0	0	0	0
N.S.	1	1.00	1.09	3.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.208	0.020	0.799	0.000	0.000	0.000	0.000	0.000

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	64	66	75	0	233	0	79	0
N.S.	1	1.00	1.03	1.17	0.00	3.64	0.00	1.23	0.00
time (sec)	N/A	0.067	0.064	0.387	0.000	0.273	0.000	0.295	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	125	116	0	325	0	243	0
N.S.	1	1.00	1.21	1.13	0.00	3.16	0.00	2.36	0.00
time (sec)	N/A	0.086	0.330	0.341	0.000	0.309	0.000	0.304	0.000

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	166	230	0	404	0	557	0
N.S.	1	1.00	1.15	1.60	0.00	2.81	0.00	3.87	0.00
time (sec)	N/A	0.131	0.338	0.346	0.000	0.323	0.000	0.296	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	194	394	0	484	0	1112	0
N.S.	1	1.00	1.04	2.12	0.00	2.60	0.00	5.98	0.00
time (sec)	N/A	0.206	0.339	0.333	0.000	0.344	0.000	0.369	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	343	148	309	0	147	366	440	0
N.S.	1	1.00	0.43	0.90	0.00	0.43	1.07	1.28	0.00
time (sec)	N/A	0.403	0.607	1.039	0.000	0.253	0.460	0.288	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	111	182	0	111	243	271	0
N.S.	1	1.00	0.50	0.83	0.00	0.50	1.10	1.23	0.00
time (sec)	N/A	0.275	0.437	0.684	0.000	0.250	0.314	0.280	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	130	130	83	124	0	80	138	139	0
N.S.	1	1.00	0.64	0.95	0.00	0.62	1.06	1.07	0.00
time (sec)	N/A	0.169	0.263	0.391	0.000	0.255	0.245	0.293	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	49	48	0	53	63	52	44
N.S.	1	1.00	1.04	1.02	0.00	1.13	1.34	1.11	0.94
time (sec)	N/A	0.038	0.034	0.316	0.000	0.257	0.110	0.276	0.247

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	271	271	309	0	0	0	0	0	0
N.S.	1	1.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.289	0.046	0.000	0.000	0.000	0.000	0.000	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	208	208	301	0	0	0	0	0
N.S.	1	0.90	0.90	1.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.326	0.161	0.914	0.000	0.000	0.000	0.000	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	272	272	314	521	0	0	0	0	0
N.S.	1	1.00	1.15	1.92	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.397	0.149	1.288	0.000	0.000	0.000	0.000	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	371	371	181	294	0	152	432	389	0
N.S.	1	1.00	0.49	0.79	0.00	0.41	1.16	1.05	0.00
time (sec)	N/A	0.328	0.540	0.920	0.000	0.264	0.443	0.295	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	135	185	0	108	248	203	0
N.S.	1	1.00	0.64	0.88	0.00	0.51	1.18	0.96	0.00
time (sec)	N/A	0.222	0.351	0.444	0.000	0.259	0.330	0.280	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	74	71	0	66	109	78	59
N.S.	1	1.00	0.90	0.87	0.00	0.80	1.33	0.95	0.72
time (sec)	N/A	0.056	0.037	0.316	0.000	0.252	0.153	0.282	0.267

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	365	365	424	0	0	0	0	0	0
N.S.	1	1.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.318	0.048	0.000	0.000	0.000	0.000	0.000	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	316	316	309	0	0	0	0	0	0
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.444	0.146	0.000	0.000	0.000	0.000	0.000	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	45	49	0	0	0	56	0
N.S.	1	1.00	0.75	0.82	0.00	0.00	0.00	0.93	0.00
time (sec)	N/A	0.471	0.371	0.591	0.000	0.000	0.000	0.299	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	30	30	30	27	0	0	0	28	0
N.S.	1	1.00	1.00	0.90	0.00	0.00	0.00	0.93	0.00
time (sec)	N/A	0.162	0.189	0.375	0.000	0.000	0.000	0.291	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	11	11	11	12	0	0	0	11	0
N.S.	1	1.00	1.00	1.09	0.00	0.00	0.00	1.00	0.00
time (sec)	N/A	0.017	0.018	0.207	0.000	0.000	0.000	0.279	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	12	14	14	10	14	14
N.S.	1	1.00	1.17	1.00	1.17	1.17	0.83	1.17	1.17
time (sec)	N/A	0.030	0.381	6.883	0.362	0.250	0.336	0.305	0.229

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	161	86	149	0	0	0	169	0
N.S.	1	1.92	1.02	1.77	0.00	0.00	0.00	2.01	0.00
time (sec)	N/A	0.155	2.239	0.697	0.000	0.000	0.000	0.314	0.000

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	87	63	72	0	0	0	83	0
N.S.	1	1.58	1.15	1.31	0.00	0.00	0.00	1.51	0.00
time (sec)	N/A	0.100	0.395	0.580	0.000	0.000	0.000	0.284	0.000

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	37	38	0	0	0	39	0
N.S.	1	1.00	0.90	0.93	0.00	0.00	0.00	0.95	0.00
time (sec)	N/A	0.053	0.126	0.344	0.000	0.000	0.000	0.271	0.000

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	12	174	14	12	14	14
N.S.	1	1.00	1.17	1.00	14.50	1.17	1.00	1.17	1.17
time (sec)	N/A	0.029	5.406	11.409	2.514	0.243	0.406	0.297	0.225

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	263	115	215	0	0	0	272	0
N.S.	1	1.49	0.65	1.22	0.00	0.00	0.00	1.55	0.00
time (sec)	N/A	0.364	0.608	0.704	0.000	0.000	0.000	0.323	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	151	121	109	0	0	0	139	0
N.S.	1	1.40	1.12	1.01	0.00	0.00	0.00	1.29	0.00
time (sec)	N/A	0.186	0.219	0.517	0.000	0.000	0.000	0.302	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	65	65	53	0	0	0	57	0
N.S.	1	1.00	1.00	0.82	0.00	0.00	0.00	0.88	0.00
time (sec)	N/A	0.058	0.038	0.333	0.000	0.000	0.000	0.296	0.000

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	12	172	14	12	14	14
N.S.	1	1.00	1.17	1.00	14.33	1.17	1.00	1.17	1.17
time (sec)	N/A	0.028	2.869	9.023	57.493	0.239	0.480	0.329	0.227

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	535	535	459	777	0	0	0	2255	0
N.S.	1	1.00	0.86	1.45	0.00	0.00	0.00	4.21	0.00
time (sec)	N/A	1.625	3.252	1.253	0.000	0.000	0.000	1.450	0.000

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	269	269	248	390	0	0	0	1079	0
N.S.	1	1.00	0.92	1.45	0.00	0.00	0.00	4.01	0.00
time (sec)	N/A	0.546	2.262	1.113	0.000	0.000	0.000	0.996	0.000

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	129	203	0	0	0	563	0
N.S.	1	1.00	0.97	1.53	0.00	0.00	0.00	4.23	0.00
time (sec)	N/A	0.179	0.119	0.753	0.000	0.000	0.000	0.660	0.000

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	343	610	599	0	0	0	1987	0
N.S.	1	1.00	1.78	1.75	0.00	0.00	0.00	5.79	0.00
time (sec)	N/A	0.730	8.876	1.269	0.000	0.000	0.000	1.022	0.000

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	311	304	0	0	0	1061	0
N.S.	1	1.00	1.78	1.74	0.00	0.00	0.00	6.06	0.00
time (sec)	N/A	0.197	2.293	0.739	0.000	0.000	0.000	0.915	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	406	406	1043	881	0	0	0	2671	0
N.S.	1	1.00	2.57	2.17	0.00	0.00	0.00	6.58	0.00
time (sec)	N/A	0.803	11.985	1.141	0.000	0.000	0.000	1.468	0.000

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	204	419	441	0	0	0	1279	0
N.S.	1	1.00	2.05	2.16	0.00	0.00	0.00	6.27	0.00
time (sec)	N/A	0.277	2.356	0.792	0.000	0.000	0.000	1.274	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F(-1)	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	545	616	0	0	0	2308	0
N.S.	1	1.00	2.24	2.53	0.00	0.00	0.00	9.50	0.00
time (sec)	N/A	0.305	4.849	0.766	0.000	0.000	0.000	1.542	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	440	440	319	384	0	0	0	646	0
N.S.	1	1.00	0.72	0.87	0.00	0.00	0.00	1.47	0.00
time (sec)	N/A	0.664	2.336	1.103	0.000	0.000	0.000	0.627	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	218	179	0	0	0	306	0
N.S.	1	1.00	1.03	0.85	0.00	0.00	0.00	1.45	0.00
time (sec)	N/A	0.308	1.467	0.996	0.000	0.000	0.000	0.488	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	131	94	0	0	0	167	0
N.S.	1	1.00	1.25	0.90	0.00	0.00	0.00	1.59	0.00
time (sec)	N/A	0.089	0.128	0.526	0.000	0.000	0.000	0.377	0.000

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	251	321	0	0	0	0	0
N.S.	1	1.00	0.87	1.12	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.381	4.142	1.011	0.000	0.000	0.000	0.000	0.000

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	185	170	0	0	0	0	0
N.S.	1	1.00	1.28	1.18	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.172	0.228	0.719	0.000	0.000	0.000	0.000	0.000

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	384	384	388	725	0	0	0	0	0
N.S.	1	1.00	1.01	1.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.611	6.287	1.158	0.000	0.000	0.000	0.000	0.000

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	238	370	0	0	0	0	0
N.S.	1	1.00	1.33	2.07	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.195	0.638	0.743	0.000	0.000	0.000	0.000	0.000

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	468	468	521	1238	0	0	0	0	0
N.S.	1	1.00	1.11	2.65	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.704	5.384	1.178	0.000	0.000	0.000	0.000	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	218	218	287	624	0	0	0	0	0
N.S.	1	1.00	1.32	2.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.279	0.385	0.783	0.000	0.000	0.000	0.000	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	16	16	18	16	18	18	15	0	18
N.S.	1	1.00	1.12	1.00	1.12	1.12	0.94	0.00	1.12
time (sec)	N/A	0.036	0.606	2.491	1.132	0.267	18.790	0.000	0.235

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	611	611	419	0	0	0	0	0	0
N.S.	1	1.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.780	0.592	0.000	0.000	0.000	0.000	0.000	0.000

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	301	301	269	0	0	0	0	0	0
N.S.	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.350	0.250	0.000	0.000	0.000	0.000	0.000	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	147	147	129	0	0	0	0	0	0
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.087	0.117	0.000	0.000	0.000	0.000	0.000	0.000

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	16	16	18	16	18	18	14	18	18
N.S.	1	1.00	1.12	1.00	1.12	1.12	0.88	1.12	1.12
time (sec)	N/A	0.039	0.338	0.460	0.955	0.270	0.621	0.495	0.229

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	77	99	1280	262	527	174	0
N.S.	1	1.00	0.73	0.93	12.08	2.47	4.97	1.64	0.00
time (sec)	N/A	0.061	0.117	0.263	0.284	0.288	0.382	0.293	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	87	90	816	209	394	136	0
N.S.	1	1.00	0.80	0.83	7.49	1.92	3.61	1.25	0.00
time (sec)	N/A	0.051	0.084	0.265	0.269	0.265	0.288	0.291	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	64	77	457	151	258	110	0
N.S.	1	1.00	0.80	0.96	5.71	1.89	3.22	1.38	0.00
time (sec)	N/A	0.051	0.055	0.261	0.276	0.257	0.181	0.292	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	59	64	204	93	148	77	0
N.S.	1	1.00	0.84	0.91	2.91	1.33	2.11	1.10	0.00
time (sec)	N/A	0.044	0.076	0.118	0.265	0.249	0.126	0.297	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	40	40	159	36	35	48	51	35	92
N.S.	1	1.00	3.98	0.90	0.88	1.20	1.28	0.88	2.30
time (sec)	N/A	0.017	0.377	0.128	0.258	0.251	0.091	0.277	0.633

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	71	154	0	0	0	0	0
N.S.	1	1.00	0.80	1.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.133	0.578	0.000	0.000	0.000	0.000	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	45	56	0	101	0	108	0
N.S.	1	1.00	0.88	1.10	0.00	1.98	0.00	2.12	0.00
time (sec)	N/A	0.045	0.035	0.227	0.000	0.267	0.000	0.302	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	49	62	120	102	0	231	0
N.S.	1	1.00	0.80	1.02	1.97	1.67	0.00	3.79	0.00
time (sec)	N/A	0.038	0.060	0.234	0.267	0.276	0.000	0.307	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	88	88	77	78	0	209	0	388	0
N.S.	1	1.00	0.88	0.89	0.00	2.38	0.00	4.41	0.00
time (sec)	N/A	0.058	0.081	0.274	0.000	0.307	0.000	0.666	0.000

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	63	84	263	193	0	447	0
N.S.	1	1.00	0.67	0.89	2.80	2.05	0.00	4.76	0.00
time (sec)	N/A	0.049	0.084	0.244	0.298	0.294	0.000	0.341	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	B	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	65	100	0	321	0	598	0
N.S.	1	1.00	0.54	0.83	0.00	2.65	0.00	4.94	0.00
time (sec)	N/A	0.070	0.090	0.269	0.000	0.343	0.000	0.718	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	164	194	0	567	1268	443	0
N.S.	1	1.00	0.81	0.96	0.00	2.79	6.25	2.18	0.00
time (sec)	N/A	0.241	0.402	1.036	0.000	0.276	0.637	0.323	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	142	203	0	442	916	342	0
N.S.	1	1.00	0.81	1.15	0.00	2.51	5.20	1.94	0.00
time (sec)	N/A	0.213	0.202	0.888	0.000	0.269	0.486	0.317	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	112	152	0	307	610	274	0
N.S.	1	1.00	0.80	1.09	0.00	2.19	4.36	1.96	0.00
time (sec)	N/A	0.162	0.201	0.997	0.000	0.261	0.307	0.311	0.000

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	86	146	0	188	335	184	0
N.S.	1	1.00	0.82	1.39	0.00	1.79	3.19	1.75	0.00
time (sec)	N/A	0.108	0.077	0.460	0.000	0.274	0.205	0.317	0.000

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	61	90	0	94	143	111	88
N.S.	1	1.00	1.03	1.53	0.00	1.59	2.42	1.88	1.49
time (sec)	N/A	0.054	0.099	0.417	0.000	0.266	0.123	0.287	0.518

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	170	367	0	0	0	0	0
N.S.	1	1.00	1.35	2.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.144	0.356	0.654	0.000	0.000	0.000	0.000	0.000

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	176	207	0	0	0	0	0
N.S.	1	1.00	1.52	1.78	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.119	0.829	0.460	0.000	0.000	0.000	0.000	0.000

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	87	126	125	236	146	0	510	0
N.S.	1	1.00	1.45	1.44	2.71	1.68	0.00	5.86	0.00
time (sec)	N/A	0.098	0.463	0.662	0.284	0.301	0.000	0.369	0.000

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	246	262	0	0	0	0	0
N.S.	1	1.00	1.32	1.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.174	2.533	0.987	0.000	0.000	0.000	0.000	0.000

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	338	338	307	383	0	996	2518	832	0
N.S.	1	1.00	0.91	1.13	0.00	2.95	7.45	2.46	0.00
time (sec)	N/A	0.366	0.942	3.282	0.000	0.287	1.074	0.361	0.000

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	232	394	0	769	1828	641	0
N.S.	1	1.00	0.81	1.37	0.00	2.68	6.37	2.23	0.00
time (sec)	N/A	0.268	0.463	1.137	0.000	0.311	0.759	0.347	0.000

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	235	235	199	280	0	530	1173	504	0
N.S.	1	1.00	0.85	1.19	0.00	2.26	4.99	2.14	0.00
time (sec)	N/A	0.217	0.352	1.049	0.000	0.280	0.494	0.355	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	165	165	137	266	0	329	685	340	0
N.S.	1	1.00	0.83	1.61	0.00	1.99	4.15	2.06	0.00
time (sec)	N/A	0.148	0.205	0.638	0.000	0.272	0.319	0.340	0.000

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	96	166	0	158	282	208	152
N.S.	1	1.00	0.92	1.60	0.00	1.52	2.71	2.00	1.46
time (sec)	N/A	0.081	0.079	0.455	0.000	0.262	0.187	0.295	0.512

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	304	652	0	0	0	0	0
N.S.	1	1.00	1.80	3.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.158	0.469	0.711	0.000	0.000	0.000	0.000	0.000

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	342	428	0	0	0	0	0
N.S.	1	1.00	1.80	2.25	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.181	1.108	0.794	0.000	0.000	0.000	0.000	0.000

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	167	167	248	324	0	0	0	0	0
N.S.	1	1.00	1.49	1.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.175	1.153	0.912	0.000	0.000	0.000	0.000	0.000

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	291	291	732	550	0	0	0	0	0
N.S.	1	1.00	2.52	1.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.293	8.262	1.249	0.000	0.000	0.000	0.000	0.000

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	357	357	287	657	0	1148	2876	1016	0
N.S.	1	1.00	0.80	1.84	0.00	3.22	8.06	2.85	0.00
time (sec)	N/A	0.455	0.463	1.383	0.000	0.302	1.212	0.381	0.000

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	289	289	235	440	0	784	1889	809	0
N.S.	1	1.00	0.81	1.52	0.00	2.71	6.54	2.80	0.00
time (sec)	N/A	0.350	0.645	1.194	0.000	0.288	0.717	0.403	0.000

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	198	198	163	412	0	483	1027	533	0
N.S.	1	1.00	0.82	2.08	0.00	2.44	5.19	2.69	0.00
time (sec)	N/A	0.220	0.276	0.885	0.000	0.282	0.491	0.372	0.000

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	115	255	0	233	444	329	229
N.S.	1	1.00	0.97	2.14	0.00	1.96	3.73	2.76	1.92
time (sec)	N/A	0.114	0.159	0.655	0.000	0.272	0.264	0.303	0.614

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	439	1007	0	0	0	0	0
N.S.	1	1.00	2.17	4.99	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.186	0.810	0.814	0.000	0.000	0.000	0.000	0.000

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	575	721	0	0	0	0	0
N.S.	1	1.00	2.13	2.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.223	2.324	0.911	0.000	0.000	0.000	0.000	0.000

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	198	198	385	593	0	0	0	0	0
N.S.	1	1.00	1.94	2.99	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.226	1.871	1.068	0.000	0.000	0.000	0.000	0.000

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	439	439	1274	1009	0	0	0	0	0
N.S.	1	1.00	2.90	2.30	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.404	11.489	1.376	0.000	0.000	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	150	367	0	323	663	482	317
N.S.	1	1.00	0.91	2.24	0.00	1.97	4.04	2.94	1.93
time (sec)	N/A	0.158	0.192	0.658	0.000	0.258	0.408	0.297	0.697

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	213	213	150	153	0	0	0	419	0
N.S.	1	1.00	0.70	0.72	0.00	0.00	0.00	1.97	0.00
time (sec)	N/A	0.249	0.561	0.282	0.000	0.000	0.000	0.350	0.000

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	109	112	0	0	0	277	0
N.S.	1	1.00	0.75	0.77	0.00	0.00	0.00	1.91	0.00
time (sec)	N/A	0.195	0.458	0.303	0.000	0.000	0.000	0.334	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	102	103	0	0	0	203	0
N.S.	1	1.00	0.72	0.73	0.00	0.00	0.00	1.44	0.00
time (sec)	N/A	0.166	0.394	0.320	0.000	0.000	0.000	0.332	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	61	60	0	0	0	95	0
N.S.	1	1.00	0.88	0.87	0.00	0.00	0.00	1.38	0.00
time (sec)	N/A	0.090	0.125	0.213	0.000	0.000	0.000	0.322	0.000

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	48	52	0	0	0	53	0
N.S.	1	1.00	0.84	0.91	0.00	0.00	0.00	0.93	0.00
time (sec)	N/A	0.061	0.026	0.263	0.000	0.000	0.000	0.334	0.000

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	25	31	34	25	25
N.S.	1	1.00	1.09	1.00	1.09	1.35	1.48	1.09	1.09
time (sec)	N/A	0.042	0.960	0.341	0.358	0.244	1.027	0.903	0.255

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	258	258	283	396	0	0	0	1401	0
N.S.	1	1.00	1.10	1.53	0.00	0.00	0.00	5.43	0.00
time (sec)	N/A	0.237	1.613	0.746	0.000	0.000	0.000	0.418	0.000

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	220	280	0	0	0	928	0
N.S.	1	1.00	1.16	1.47	0.00	0.00	0.00	4.88	0.00
time (sec)	N/A	0.178	1.344	0.296	0.000	0.000	0.000	0.409	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	140	266	0	0	0	698	0
N.S.	1	1.00	0.75	1.43	0.00	0.00	0.00	3.75	0.00
time (sec)	N/A	0.162	1.231	0.618	0.000	0.000	0.000	0.408	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	99	151	0	0	0	341	0
N.S.	1	1.00	0.95	1.45	0.00	0.00	0.00	3.28	0.00
time (sec)	N/A	0.092	0.517	0.205	0.000	0.000	0.000	0.365	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	93	93	79	82	0	0	0	215	0
N.S.	1	1.00	0.85	0.88	0.00	0.00	0.00	2.31	0.00
time (sec)	N/A	0.112	0.303	0.410	0.000	0.000	0.000	0.307	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	357	61	73	25	25
N.S.	1	1.00	1.09	1.00	15.52	2.65	3.17	1.09	1.09
time (sec)	N/A	0.041	4.963	0.381	4.164	0.241	1.863	2.153	0.270

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	322	322	317	720	0	0	0	3180	0
N.S.	1	1.00	0.98	2.24	0.00	0.00	0.00	9.88	0.00
time (sec)	N/A	0.550	1.528	0.871	0.000	0.000	0.000	0.613	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	249	249	181	507	0	0	0	2201	0
N.S.	1	1.00	0.73	2.04	0.00	0.00	0.00	8.84	0.00
time (sec)	N/A	0.421	0.890	0.341	0.000	0.000	0.000	0.542	0.000

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	248	248	219	476	0	0	0	1641	0
N.S.	1	1.00	0.88	1.92	0.00	0.00	0.00	6.62	0.00
time (sec)	N/A	0.373	0.904	0.753	0.000	0.000	0.000	0.584	0.000

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	122	264	0	0	0	888	0
N.S.	1	1.00	0.78	1.68	0.00	0.00	0.00	5.66	0.00
time (sec)	N/A	0.214	0.481	0.241	0.000	0.000	0.000	0.502	0.000

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	102	158	0	0	0	547	0
N.S.	1	1.00	0.80	1.24	0.00	0.00	0.00	4.31	0.00
time (sec)	N/A	0.123	0.410	0.458	0.000	0.000	0.000	0.310	0.000

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	520	91	112	25	25
N.S.	1	1.00	1.09	1.00	22.61	3.96	4.87	1.09	1.09
time (sec)	N/A	0.040	1.303	0.684	196.969	0.263	3.615	7.284	0.253

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	416	416	414	1138	0	0	0	5870	0
N.S.	1	1.00	1.00	2.74	0.00	0.00	0.00	14.11	0.00
time (sec)	N/A	0.544	1.687	0.909	0.000	0.000	0.000	0.792	0.000

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	346	346	320	783	0	0	0	4040	0
N.S.	1	1.00	0.92	2.26	0.00	0.00	0.00	11.68	0.00
time (sec)	N/A	0.412	1.257	0.332	0.000	0.000	0.000	0.756	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	264	753	0	0	0	3109	0
N.S.	1	1.00	0.78	2.23	0.00	0.00	0.00	9.23	0.00
time (sec)	N/A	0.431	1.260	0.757	0.000	0.000	0.000	0.780	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	186	399	0	0	0	1665	0
N.S.	1	1.00	0.89	1.92	0.00	0.00	0.00	8.00	0.00
time (sec)	N/A	0.221	0.884	0.221	0.000	0.000	0.000	0.736	0.000

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	134	270	0	0	0	1112	0
N.S.	1	1.00	0.82	1.65	0.00	0.00	0.00	6.78	0.00
time (sec)	N/A	0.179	0.448	0.565	0.000	0.000	0.000	0.309	0.000

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	0	121	151	25	25
N.S.	1	1.00	1.09	1.00	0.00	5.26	6.57	1.09	1.09
time (sec)	N/A	0.041	15.145	1.273	0.000	0.272	7.756	21.185	0.280

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-1)	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	156	387	0	0	0	1915	0
N.S.	1	1.00	0.82	2.03	0.00	0.00	0.00	10.03	0.00
time (sec)	N/A	0.188	0.502	0.519	0.000	0.000	0.000	0.309	0.000

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	288	288	253	395	0	0	0	1088	0
N.S.	1	1.00	0.88	1.37	0.00	0.00	0.00	3.78	0.00
time (sec)	N/A	0.404	0.219	1.141	0.000	0.000	0.000	1.262	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	274	274	248	394	0	0	0	1169	0
N.S.	1	1.00	0.91	1.44	0.00	0.00	0.00	4.27	0.00
time (sec)	N/A	0.393	0.319	1.170	0.000	0.000	0.000	1.316	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	138	203	0	0	0	488	0
N.S.	1	1.00	0.88	1.30	0.00	0.00	0.00	3.13	0.00
time (sec)	N/A	0.250	0.080	0.792	0.000	0.000	0.000	1.118	0.000

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	129	203	0	0	0	563	0
N.S.	1	1.00	0.97	1.53	0.00	0.00	0.00	4.23	0.00
time (sec)	N/A	0.159	0.043	0.318	0.000	0.000	0.000	0.642	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	20	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	0.80	1.00	1.00
time (sec)	N/A	0.058	0.531	0.597	0.924	0.000	0.415	1.357	0.253

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	252	604	0	0	0	2237	0
N.S.	1	1.00	0.66	1.59	0.00	0.00	0.00	5.89	0.00
time (sec)	N/A	0.684	0.283	1.218	0.000	0.000	0.000	1.293	0.000

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	268	600	0	0	0	2199	0
N.S.	1	1.00	0.74	1.66	0.00	0.00	0.00	6.09	0.00
time (sec)	N/A	0.590	0.322	1.214	0.000	0.000	0.000	1.559	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	199	137	308	0	0	0	929	0
N.S.	1	1.00	0.69	1.55	0.00	0.00	0.00	4.67	0.00
time (sec)	N/A	0.299	0.088	0.874	0.000	0.000	0.000	0.863	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	311	304	0	0	0	1061	0
N.S.	1	1.00	1.78	1.74	0.00	0.00	0.00	6.06	0.00
time (sec)	N/A	0.188	1.791	0.353	0.000	0.000	0.000	0.901	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	51	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	2.04	1.00	1.00
time (sec)	N/A	0.069	0.317	0.546	1.104	0.000	3.309	0.944	0.247

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	475	475	255	886	0	0	0	3408	0
N.S.	1	1.00	0.54	1.87	0.00	0.00	0.00	7.17	0.00
time (sec)	N/A	1.000	0.198	1.227	0.000	0.000	0.000	1.852	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	427	427	249	879	0	0	0	2826	0
N.S.	1	1.00	0.58	2.06	0.00	0.00	0.00	6.62	0.00
time (sec)	N/A	0.830	0.309	1.239	0.000	0.000	0.000	2.214	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	256	256	140	449	0	0	0	1449	0
N.S.	1	1.00	0.55	1.75	0.00	0.00	0.00	5.66	0.00
time (sec)	N/A	0.447	0.081	0.850	0.000	0.000	0.000	1.126	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	204	419	441	0	0	0	1279	0
N.S.	1	1.00	2.05	2.16	0.00	0.00	0.00	6.27	0.00
time (sec)	N/A	0.268	2.348	0.333	0.000	0.000	0.000	1.256	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	88	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	3.52	1.00	1.00
time (sec)	N/A	0.065	0.387	0.662	1.276	0.000	24.397	0.978	0.237

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F(-1)	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	518	518	267	1234	0	0	0	8028	0
N.S.	1	1.00	0.52	2.38	0.00	0.00	0.00	15.50	0.00
time (sec)	N/A	1.066	0.358	1.315	0.000	0.000	0.000	3.007	0.000

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F(-1)	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	301	137	654	0	0	0	2561	0
N.S.	1	1.00	0.46	2.17	0.00	0.00	0.00	8.51	0.00
time (sec)	N/A	0.516	0.096	0.921	0.000	0.000	0.000	1.342	0.000

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F(-1)	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	545	616	0	0	0	2308	0
N.S.	1	1.00	2.24	2.53	0.00	0.00	0.00	9.50	0.00
time (sec)	N/A	0.291	3.202	0.359	0.000	0.000	0.000	1.539	0.000

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	0	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	0.00	1.00	1.00
time (sec)	N/A	0.066	0.382	0.697	2.035	0.000	0.000	0.979	0.270

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	365	370	317	0	0	0	507	0
N.S.	1	1.00	1.01	0.87	0.00	0.00	0.00	1.39	0.00
time (sec)	N/A	0.483	0.301	1.290	0.000	0.000	0.000	0.817	0.000

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	233	233	249	186	0	0	0	318	0
N.S.	1	1.00	1.07	0.80	0.00	0.00	0.00	1.36	0.00
time (sec)	N/A	0.301	0.178	1.145	0.000	0.000	0.000	0.743	0.000

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	243	249	207	0	0	0	345	0
N.S.	1	1.00	1.02	0.85	0.00	0.00	0.00	1.42	0.00
time (sec)	N/A	0.314	0.276	1.092	0.000	0.000	0.000	0.743	0.000

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	134	96	0	0	0	142	0
N.S.	1	1.00	1.28	0.91	0.00	0.00	0.00	1.35	0.00
time (sec)	N/A	0.141	0.075	0.679	0.000	0.000	0.000	0.698	0.000

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	131	94	0	0	0	167	0
N.S.	1	1.00	1.25	0.90	0.00	0.00	0.00	1.59	0.00
time (sec)	N/A	0.082	0.083	0.125	0.000	0.000	0.000	0.386	0.000

Problem 264	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	36	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	1.44	1.00	1.00
time (sec)	N/A	0.064	0.171	0.556	0.974	0.000	0.741	0.845	0.273

Problem 265	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	412	412	572	483	0	0	0	0	0
N.S.	1	1.00	1.39	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.499	0.819	1.531	0.000	0.000	0.000	0.000	0.000

Problem 266	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	300	329	0	0	0	0	0
N.S.	1	1.00	1.11	1.22	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.315	0.361	1.169	0.000	0.000	0.000	0.000	0.000

Problem 267	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	280	280	380	326	0	0	0	0	0
N.S.	1	1.00	1.36	1.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.317	0.447	1.303	0.000	0.000	0.000	0.000	0.000

Problem 268	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	168	169	0	0	0	0	0
N.S.	1	1.00	1.17	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.147	0.174	0.884	0.000	0.000	0.000	0.000	0.000

Problem 269	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	185	170	0	0	0	0	0
N.S.	1	1.00	1.28	1.18	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.180	0.163	0.323	0.000	0.000	0.000	0.000	0.000

Problem 270	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	88	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	3.52	1.00	1.00
time (sec)	N/A	0.075	0.193	0.971	1.129	0.000	1.971	2.558	0.289

Problem 271	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	344	344	351	733	0	0	0	0	0
N.S.	1	1.00	1.02	2.13	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.736	2.224	1.295	0.000	0.000	0.000	0.000	0.000

Problem 272	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	342	342	411	733	0	0	0	0	0
N.S.	1	1.00	1.20	2.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.685	2.059	1.179	0.000	0.000	0.000	0.000	0.000

Problem 273	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	192	370	0	0	0	0	0
N.S.	1	1.00	0.93	1.79	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.350	1.224	0.979	0.000	0.000	0.000	0.000	0.000

Problem 274	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	238	370	0	0	0	0	0
N.S.	1	1.00	1.33	2.07	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.212	0.553	0.309	0.000	0.000	0.000	0.000	0.000

Problem 275	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	155	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	6.20	1.00	1.00
time (sec)	N/A	0.067	0.205	1.072	1.379	0.000	8.534	5.947	0.256

Problem 276	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	442	442	445	1247	0	0	0	0	0
N.S.	1	1.00	1.01	2.82	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.699	2.805	1.339	0.000	0.000	0.000	0.000	0.000

Problem 277	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	441	441	538	1247	0	0	0	0	0
N.S.	1	1.00	1.22	2.83	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.736	2.159	1.301	0.000	0.000	0.000	0.000	0.000

Problem 278	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	252	252	254	625	0	0	0	0	0
N.S.	1	1.00	1.01	2.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.355	0.951	0.850	0.000	0.000	0.000	0.000	0.000

Problem 279	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	218	218	287	624	0	0	0	0	0
N.S.	1	1.00	1.32	2.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.280	0.270	0.362	0.000	0.000	0.000	0.000	0.000

Problem 280	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	0	221	25	25
N.S.	1	1.00	1.08	0.92	1.00	0.00	8.84	1.00	1.00
time (sec)	N/A	0.070	0.217	0.953	1.387	0.000	111.307	15.600	0.279

Problem 281	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F(-2)	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	115	228	0	273	0	0	0
N.S.	1	1.00	0.74	1.46	0.00	1.75	0.00	0.00	0.00
time (sec)	N/A	0.087	0.253	2.974	0.000	0.122	0.000	0.000	0.000

Problem 282	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	115	206	0	220	0	0	0
N.S.	1	1.00	0.85	1.51	0.00	1.62	0.00	0.00	0.00
time (sec)	N/A	0.080	0.191	2.878	0.000	0.124	0.000	0.000	0.000

Problem 283	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	87	194	0	152	0	0	0
N.S.	1	1.00	0.74	1.66	0.00	1.30	0.00	0.00	0.00
time (sec)	N/A	0.076	0.057	2.447	0.000	0.108	0.000	0.000	0.000

Problem 284	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	87	172	0	108	0	0	0
N.S.	1	1.00	0.88	1.74	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.059	0.037	2.042	0.000	0.102	0.000	0.000	0.000

Problem 285	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F(-2)	C	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	59	149	0	68	0	0	0
N.S.	1	1.00	0.73	1.84	0.00	0.84	0.00	0.00	0.00
time (sec)	N/A	0.054	0.037	1.772	0.000	0.095	0.000	0.000	0.000

Problem 286	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	54	132	0	84	0	0	0
N.S.	1	1.00	0.89	2.16	0.00	1.38	0.00	0.00	0.00
time (sec)	N/A	0.049	0.030	1.529	0.000	0.099	0.000	0.000	0.000

Problem 287	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	56	190	0	148	0	0	0
N.S.	1	1.00	0.46	1.56	0.00	1.21	0.00	0.00	0.00
time (sec)	N/A	0.071	0.038	1.720	0.000	0.104	0.000	0.000	0.000

Problem 288	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	C	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	102	59	169	0	175	0	0	0
N.S.	1	1.00	0.58	1.66	0.00	1.72	0.00	0.00	0.00
time (sec)	N/A	0.063	0.043	2.097	0.000	0.104	0.000	0.000	0.000

Problem 289	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F(-2)	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	66	225	0	236	0	0	0
N.S.	1	1.00	0.42	1.42	0.00	1.48	0.00	0.00	0.00
time (sec)	N/A	0.089	0.056	2.533	0.000	0.107	0.000	0.000	0.000

Problem 290	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	C	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	66	203	0	263	0	0	0
N.S.	1	1.00	0.47	1.46	0.00	1.89	0.00	0.00	0.00
time (sec)	N/A	0.084	0.051	3.015	0.000	0.112	0.000	0.000	0.000

Problem 291	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	114	0	0	0	0	0	0
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.143	0.127	0.000	0.000	0.000	0.000	0.000	0.000

Problem 292	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	106	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.124	0.000	0.000	0.000	0.000	0.000	0.000

Problem 293	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	107	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.107	0.000	0.000	0.000	0.000	0.000	0.000

Problem 294	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	107	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.138	0.101	0.000	0.000	0.000	0.000	0.000	0.000

Problem 295	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	128	128	107	0	0	0	0	0	0
N.S.	1	1.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.132	0.089	0.000	0.000	0.000	0.000	0.000	0.000

Problem 296	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	126	126	104	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.133	0.088	0.000	0.000	0.000	0.000	0.000	0.000

Problem 297	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	102	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.136	0.093	0.000	0.000	0.000	0.000	0.000	0.000

Problem 298	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	106	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.139	0.092	0.000	0.000	0.000	0.000	0.000	0.000

Problem 299	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	114	0	0	0	0	0	0
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.139	0.103	0.000	0.000	0.000	0.000	0.000	0.000

Problem 300	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	F(-1)	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	0	23	0	55	22	25	25
N.S.	1	1.00	0.00	0.92	0.00	2.20	0.88	1.00	1.00
time (sec)	N/A	0.122	0.000	0.428	0.000	0.254	70.919	0.933	0.316

Problem 301	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	F(-2)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	55	0	25	25
N.S.	1	1.00	1.08	0.92	0.00	2.20	0.00	1.00	1.00
time (sec)	N/A	0.117	91.049	0.112	0.000	0.256	0.000	0.835	0.318

Problem 302	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	83	22	25	25
N.S.	1	1.00	1.08	0.92	0.00	3.32	0.88	1.00	1.00
time (sec)	N/A	0.117	49.627	1.302	0.000	0.262	20.422	0.547	0.286

Problem 303	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	97	22	25	25
N.S.	1	1.00	1.08	0.92	0.00	3.88	0.88	1.00	1.00
time (sec)	N/A	0.131	45.152	0.532	0.000	0.263	30.894	0.558	0.290

Problem 304	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	71	22	25	25
N.S.	1	1.00	1.08	0.92	0.00	2.84	0.88	1.00	1.00
time (sec)	N/A	0.124	164.931	0.389	0.000	0.277	73.332	1.749	0.358

Problem 305	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	F(-2)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	71	0	25	25
N.S.	1	1.00	1.08	0.92	0.00	2.84	0.00	1.00	1.00
time (sec)	N/A	0.115	15.470	0.088	0.000	0.270	0.000	1.251	0.365

Problem 306	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	99	22	25	25
N.S.	1	1.00	1.08	0.92	0.00	3.96	0.88	1.00	1.00
time (sec)	N/A	0.122	27.877	1.358	0.000	0.262	26.310	0.730	0.294

Problem 307	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	0	113	22	25	25
N.S.	1	1.00	1.08	0.92	0.00	4.52	0.88	1.00	1.00
time (sec)	N/A	0.127	10.788	0.798	0.000	0.265	40.213	0.770	0.290

Problem 308	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	618	71	20	25	25
N.S.	1	1.00	1.09	1.00	26.87	3.09	0.87	1.09	1.09
time (sec)	N/A	0.126	1.607	2.296	10.102	0.268	52.553	0.507	0.415

Problem 309	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	469	55	20	25	25
N.S.	1	1.00	1.09	1.00	20.39	2.39	0.87	1.09	1.09
time (sec)	N/A	0.118	0.813	2.171	7.430	0.265	20.491	0.470	0.409

Problem 310	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	183	183	151	0	0	0	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.136	0.078	0.000	0.000	0.000	0.000	0.000	0.000

Problem 311	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	89	89	77	0	0	0	0	0	0
N.S.	1	1.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.044	0.030	0.000	0.000	0.000	0.000	0.000	0.000

Problem 312	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	25	25	19	25	25
N.S.	1	1.00	1.09	1.00	1.09	1.09	0.83	1.09	1.09
time (sec)	N/A	0.040	0.459	4.290	0.394	0.259	1.016	0.377	0.245

Problem 313	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	133	215	0	110	0	162	0
N.S.	1	1.00	0.99	1.59	0.00	0.81	0.00	1.20	0.00
time (sec)	N/A	0.135	0.089	1.846	0.000	0.275	0.000	0.344	0.000

Problem 314	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	116	179	0	91	0	125	0
N.S.	1	1.00	1.05	1.61	0.00	0.82	0.00	1.13	0.00
time (sec)	N/A	0.091	0.075	1.751	0.000	0.247	0.000	0.341	0.000

Problem 315	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	64	96	240	63	0	79	0
N.S.	1	1.00	1.02	1.52	3.81	1.00	0.00	1.25	0.00
time (sec)	N/A	0.048	0.043	1.502	0.313	0.256	0.000	0.299	0.000

Problem 316	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	24	23	0	0	0	27	0
N.S.	1	1.00	0.77	0.74	0.00	0.00	0.00	0.87	0.00
time (sec)	N/A	0.076	0.057	1.792	0.000	0.000	0.000	0.313	0.000

Problem 317	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	46	42	0	0	0	44	0
N.S.	1	1.00	1.18	1.08	0.00	0.00	0.00	1.13	0.00
time (sec)	N/A	0.078	0.046	1.755	0.000	0.000	0.000	0.349	0.000

Problem 318	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	73	88	61	0	0	0	84	0
N.S.	1	1.03	1.24	0.86	0.00	0.00	0.00	1.18	0.00
time (sec)	N/A	0.079	0.211	1.744	0.000	0.000	0.000	0.359	0.000

Problem 319	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	117	81	0	0	0	128	0
N.S.	1	1.00	1.02	0.70	0.00	0.00	0.00	1.11	0.00
time (sec)	N/A	0.152	0.073	1.707	0.000	0.000	0.000	0.368	0.000

Problem 320	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	272	628	0	243	694	296	0
N.S.	1	1.00	1.11	2.56	0.00	0.99	2.83	1.21	0.00
time (sec)	N/A	0.230	0.150	2.599	0.000	0.268	1.276	0.365	0.000

Problem 321	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	199	216	515	0	185	568	227	0
N.S.	1	1.00	1.09	2.59	0.00	0.93	2.85	1.14	0.00
time (sec)	N/A	0.141	0.125	2.621	0.000	0.252	0.899	0.370	0.000

Problem 322	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	B	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	129	280	402	125	298	141	0
N.S.	1	1.00	1.17	2.55	3.65	1.14	2.71	1.28	0.00
time (sec)	N/A	0.080	0.055	1.991	0.304	0.263	0.619	0.350	0.000

Problem 323	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	37	36	0	0	0	41	0
N.S.	1	1.00	0.79	0.77	0.00	0.00	0.00	0.87	0.00
time (sec)	N/A	0.097	0.517	1.787	0.000	0.000	0.000	0.341	0.000

Problem 324	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	70	70	0	0	0	61	0
N.S.	1	1.00	1.23	1.23	0.00	0.00	0.00	1.07	0.00
time (sec)	N/A	0.112	0.235	1.779	0.000	0.000	0.000	0.346	0.000

Problem 325	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	90	110	108	0	0	0	101	0
N.S.	1	1.00	1.22	1.20	0.00	0.00	0.00	1.12	0.00
time (sec)	N/A	0.200	0.253	1.881	0.000	0.000	0.000	0.374	0.000

Problem 326	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	143	148	0	0	0	163	0
N.S.	1	1.00	0.92	0.95	0.00	0.00	0.00	1.05	0.00
time (sec)	N/A	0.243	0.240	1.839	0.000	0.000	0.000	0.403	0.000

Problem 327	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	19	19	19	20	0	22	60	19	37
N.S.	1	1.00	1.00	1.05	0.00	1.16	3.16	1.00	1.95
time (sec)	N/A	0.057	0.023	1.882	0.000	0.264	0.445	0.292	0.527

Problem 328	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	130	13	26	13	13
N.S.	1	1.00	1.00	0.93	8.67	0.87	1.73	0.87	0.87
time (sec)	N/A	0.050	0.017	1.759	0.295	0.247	0.297	0.325	0.303

Problem 329	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	83	13	24	13	13
N.S.	1	1.00	1.00	0.93	5.53	0.87	1.60	0.87	0.87
time (sec)	N/A	0.029	0.015	1.760	0.284	0.260	0.248	0.298	0.298

Problem 330	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	11	11	11	12	0	13	22	12	11
N.S.	1	1.00	1.00	1.09	0.00	1.18	2.00	1.09	1.00
time (sec)	N/A	0.054	0.028	1.687	0.000	0.235	0.279	0.307	0.301

Problem 331	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	14	33	13	26	13	13
N.S.	1	1.00	1.00	1.08	2.54	1.00	2.00	1.00	1.00
time (sec)	N/A	0.050	0.014	1.816	0.611	0.241	0.461	0.359	0.289

Problem 332	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	33	13	29	13	13
N.S.	1	1.00	1.00	0.93	2.20	0.87	1.93	0.87	0.87
time (sec)	N/A	0.049	0.014	1.817	17.146	0.227	0.653	0.360	0.271

Problem 333	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	144	229	137	0	0	0	0
N.S.	1	1.00	1.12	1.79	1.07	0.00	0.00	0.00	0.00
time (sec)	N/A	0.147	0.444	3.266	0.477	0.000	0.000	0.000	0.000

Problem 334	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	114	189	0	0	0	0	0
N.S.	1	1.00	1.18	1.95	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	0.260	2.885	0.000	0.000	0.000	0.000	0.000

Problem 335	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	B	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	66	155	160	99	0	83	0
N.S.	1	1.00	1.32	3.10	3.20	1.98	0.00	1.66	0.00
time (sec)	N/A	0.047	0.077	2.000	0.333	0.261	0.000	0.324	0.000

Problem 336	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	33	35	31	33	87	27	33	33
N.S.	1	1.00	1.06	0.94	1.00	2.64	0.82	1.00	1.00
time (sec)	N/A	0.060	0.847	2.743	0.439	0.241	3.319	0.390	0.244

Problem 337	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	33	35	31	195	87	29	33	33
N.S.	1	1.00	1.06	0.94	5.91	2.64	0.88	1.00	1.00
time (sec)	N/A	0.088	8.401	2.747	6.528	0.246	3.240	0.431	0.250

Problem 338	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	46	80	206	0	0	0	0
N.S.	1	1.00	1.00	1.74	4.48	0.00	0.00	0.00	0.00
time (sec)	N/A	0.108	0.066	0.954	0.288	0.000	0.000	0.000	0.000

Problem 339	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	54	80	200	0	0	0	0
N.S.	1	1.00	1.17	1.74	4.35	0.00	0.00	0.00	0.00
time (sec)	N/A	0.052	0.062	0.887	0.308	0.000	0.000	0.000	0.000

Problem 340	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	60	71	76	65	90	140	0
N.S.	1	1.00	0.71	0.85	0.90	0.77	1.07	1.67	0.00
time (sec)	N/A	0.044	0.044	0.109	0.335	0.248	1.484	0.260	0.000

Problem 341	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	87	95	130	65	85	110	0
N.S.	1	1.00	1.06	1.16	1.59	0.79	1.04	1.34	0.00
time (sec)	N/A	0.043	0.026	0.141	0.306	0.252	0.936	0.260	0.000

Problem 342	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	70	62	59	55	65	87	0
N.S.	1	1.00	1.13	1.00	0.95	0.89	1.05	1.40	0.00
time (sec)	N/A	0.034	0.031	0.128	0.323	0.259	0.468	0.263	0.000

Problem 343	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	62	74	88	53	60	59	50
N.S.	1	1.00	1.09	1.30	1.54	0.93	1.05	1.04	0.88
time (sec)	N/A	0.034	0.020	0.109	0.297	0.250	0.280	0.263	0.362

Problem 344	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	38	37	38	42	38	37
N.S.	1	1.00	0.96	0.84	0.82	0.84	0.93	0.84	0.82
time (sec)	N/A	0.028	0.007	0.139	0.321	0.257	0.114	0.262	0.382

Problem 345	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	69	69	64	0	0	0	0	0	57
N.S.	1	1.00	0.93	0.00	0.00	0.00	0.00	0.00	0.83
time (sec)	N/A	0.074	0.075	0.000	0.000	0.000	0.000	0.000	0.446

Problem 346	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	44	38	57	61	54	354	36
N.S.	1	1.00	1.13	0.97	1.46	1.56	1.38	9.08	0.92
time (sec)	N/A	0.026	0.006	0.101	0.286	0.274	1.180	0.319	0.336

Problem 347	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	46	54	38	42	70	176	0
N.S.	1	1.00	1.12	1.32	0.93	1.02	1.71	4.29	0.00
time (sec)	N/A	0.020	0.014	0.117	0.278	0.260	0.981	0.291	0.000

Problem 348	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	64	69	61	81	84	126	301	0
N.S.	1	1.00	1.08	0.95	1.27	1.31	1.97	4.70	0.00
time (sec)	N/A	0.034	0.021	0.116	0.269	0.298	2.099	0.478	0.000

Problem 349	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	60	64	61	54	112	342	0
N.S.	1	1.00	0.91	0.97	0.92	0.82	1.70	5.18	0.00
time (sec)	N/A	0.025	0.027	0.101	0.275	0.290	1.906	0.294	0.000

Problem 350	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	63	84	125	97	201	467	0
N.S.	1	1.00	0.71	0.94	1.40	1.09	2.26	5.25	0.00
time (sec)	N/A	0.041	0.021	0.123	0.271	0.319	5.116	1.000	0.000

Problem 351	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	68	72	82	64	170	504	0
N.S.	1	1.00	0.75	0.79	0.90	0.70	1.87	5.54	0.00
time (sec)	N/A	0.032	0.032	0.108	0.270	0.318	5.259	0.308	0.000

Problem 352	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	82	108	0	58	58	0	0
N.S.	1	1.00	0.95	1.26	0.00	0.67	0.67	0.00	0.00
time (sec)	N/A	0.036	0.161	0.937	0.000	0.097	1.356	0.000	0.000

Problem 353	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	93	101	0	59	58	0	0
N.S.	1	1.00	1.12	1.22	0.00	0.71	0.70	0.00	0.00
time (sec)	N/A	0.046	0.176	0.701	0.000	0.092	1.137	0.000	0.000

Problem 354	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	72	88	0	42	58	0	0
N.S.	1	1.00	1.18	1.44	0.00	0.69	0.95	0.00	0.00
time (sec)	N/A	0.025	0.107	0.536	0.000	0.081	0.927	0.000	0.000

Problem 355	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	A	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	39	71	0	41	49	0	0
N.S.	1	1.00	0.80	1.45	0.00	0.84	1.00	0.00	0.00
time (sec)	N/A	0.029	10.013	0.540	0.000	0.088	0.592	0.000	0.000

Problem 356	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	A	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	44	66	0	45	49	0	0
N.S.	1	1.00	1.29	1.94	0.00	1.32	1.44	0.00	0.00
time (sec)	N/A	0.017	0.049	0.387	0.000	0.113	0.757	0.000	0.000

Problem 357	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	89	97	0	0	60	0	0
N.S.	1	1.00	1.10	1.20	0.00	0.00	0.74	0.00	0.00
time (sec)	N/A	0.041	0.140	0.502	0.000	0.000	0.969	0.000	0.000

Problem 358	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	61	61	72	87	0	0	61	0	0
N.S.	1	1.00	1.18	1.43	0.00	0.00	1.00	0.00	0.00
time (sec)	N/A	0.024	0.105	0.600	0.000	0.000	1.251	0.000	0.000

Problem 359	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	100	118	0	0	65	0	0
N.S.	1	1.00	0.94	1.11	0.00	0.00	0.61	0.00	0.00
time (sec)	N/A	0.050	0.164	0.721	0.000	0.000	1.742	0.000	0.000

Problem 360	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	62	62	58	0	0	0	0	0	50
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.81
time (sec)	N/A	0.050	0.036	0.000	0.000	0.000	0.000	0.000	0.398

Problem 361	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	64	53	52	36	54	77	0
N.S.	1	1.00	0.82	0.68	0.67	0.46	0.69	0.99	0.00
time (sec)	N/A	0.022	0.029	0.082	0.283	0.253	1.246	0.276	0.000

Problem 362	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	47	41	40	31	46	50	0
N.S.	1	1.00	0.78	0.68	0.67	0.52	0.77	0.83	0.00
time (sec)	N/A	0.015	0.020	0.077	0.292	0.264	0.512	0.292	0.000

Problem 363	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	46	26	25	24	29	27	37
N.S.	1	1.00	1.24	0.70	0.68	0.65	0.78	0.73	1.00
time (sec)	N/A	0.008	0.077	0.062	0.280	0.247	0.110	0.263	0.769

Problem 364	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	53	97	0	0	0	0	42
N.S.	1	1.00	0.95	1.73	0.00	0.00	0.00	0.00	0.75
time (sec)	N/A	0.045	0.027	0.697	0.000	0.000	0.000	0.000	0.538

Problem 365	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	C	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	23	23	22	21	42	40	0
N.S.	1	1.00	0.82	0.82	0.79	0.75	1.50	1.43	0.00
time (sec)	N/A	0.009	0.012	0.070	0.265	0.245	1.585	0.283	0.000

Problem 366	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	32	35	34	28	51	74	0
N.S.	1	1.00	0.64	0.70	0.68	0.56	1.02	1.48	0.00
time (sec)	N/A	0.013	0.022	0.065	0.270	0.258	2.728	0.281	0.000

Problem 367	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	44	47	46	33	66	106	0
N.S.	1	1.00	0.65	0.69	0.68	0.49	0.97	1.56	0.00
time (sec)	N/A	0.016	0.021	0.075	0.277	0.239	8.501	0.276	0.000

Problem 368	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	49	59	58	38	78	138	0
N.S.	1	1.00	0.57	0.69	0.67	0.44	0.91	1.60	0.00
time (sec)	N/A	0.020	0.021	0.079	0.270	0.248	25.745	0.272	0.000

Problem 369	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	91	84	125	118	175	464	0
N.S.	1	1.00	1.02	0.94	1.40	1.33	1.97	5.21	0.00
time (sec)	N/A	0.047	0.063	0.464	0.277	0.268	3.726	1.012	0.000

Problem 370	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	64	59	67	59	51	107	340	0
N.S.	1	1.00	0.92	1.05	0.92	0.80	1.67	5.31	0.00
time (sec)	N/A	0.028	0.046	0.311	0.273	0.253	1.430	0.285	0.000

Problem 371	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	64	79	64	81	106	105	298	0
N.S.	1	1.00	1.23	1.00	1.27	1.66	1.64	4.66	0.00
time (sec)	N/A	0.032	0.036	0.362	0.281	0.260	1.959	0.491	0.000

Problem 372	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	47	47	36	40	58	174	36
N.S.	1	1.00	1.21	1.21	0.92	1.03	1.49	4.46	0.92
time (sec)	N/A	0.014	0.029	0.320	0.274	0.247	0.912	0.281	0.313

Problem 373	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	89	37	52	75	32	60	32
N.S.	1	1.00	2.87	1.19	1.68	2.42	1.03	1.94	1.03
time (sec)	N/A	0.017	0.060	0.313	0.271	0.262	0.980	0.279	0.781

Problem 374	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	61	134	0	0	0	0	57
N.S.	1	1.00	0.91	2.00	0.00	0.00	0.00	0.00	0.85
time (sec)	N/A	0.072	0.073	1.025	0.000	0.000	0.000	0.000	0.460

Problem 375	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	39	38	37	40	32	38	37
N.S.	1	1.00	1.00	0.97	0.95	1.03	0.82	0.97	0.95
time (sec)	N/A	0.026	0.020	0.178	0.267	0.248	0.414	0.266	0.310

Problem 376	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	65	55	86	55	112	70	50
N.S.	1	1.00	1.14	0.96	1.51	0.96	1.96	1.23	0.88
time (sec)	N/A	0.030	0.030	0.348	0.287	0.249	1.940	0.279	0.364

Problem 377	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	60	63	58	57	112	88	0
N.S.	1	1.00	0.97	1.02	0.94	0.92	1.81	1.42	0.00
time (sec)	N/A	0.034	0.046	0.356	0.291	0.254	1.674	0.272	0.000

Problem 378	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	77	75	126	67	180	111	0
N.S.	1	1.00	0.94	0.91	1.54	0.82	2.20	1.35	0.00
time (sec)	N/A	0.042	0.041	0.332	0.271	0.255	3.784	0.267	0.000

Problem 379	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	81	81	78	0	0	0	0	0	0
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.044	0.091	0.000	0.000	0.000	0.000	0.000	0.000

Problem 380	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	C	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	68	68	75	0	0	0	82	0	0
N.S.	1	1.00	1.10	0.00	0.00	0.00	1.21	0.00	0.00
time (sec)	N/A	0.035	0.059	0.000	0.000	0.000	3.953	0.000	0.000

Problem 381	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	C	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	69	69	75	0	0	0	75	0	0
N.S.	1	1.00	1.09	0.00	0.00	0.00	1.09	0.00	0.00
time (sec)	N/A	0.031	0.047	0.000	0.000	0.000	2.222	0.000	0.000

Problem 382	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	C	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	60	60	60	0	0	0	71	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	1.18	0.00	0.00
time (sec)	N/A	0.025	0.045	0.000	0.000	0.000	1.314	0.000	0.000

Problem 383	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	157	143	0	0	0	0	0
N.S.	1	1.00	2.09	1.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.079	0.148	0.974	0.000	0.000	0.000	0.000	0.000

Problem 384	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	C	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	69	69	68	0	0	0	73	0	0
N.S.	1	1.00	0.99	0.00	0.00	0.00	1.06	0.00	0.00
time (sec)	N/A	0.034	0.061	0.000	0.000	0.000	2.270	0.000	0.000

Problem 385	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	C	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	72	72	75	0	0	0	75	0	0
N.S.	1	1.00	1.04	0.00	0.00	0.00	1.04	0.00	0.00
time (sec)	N/A	0.034	0.046	0.000	0.000	0.000	4.232	0.000	0.000

Problem 386	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	116	258	245	97	204	254	0
N.S.	1	1.00	0.90	2.00	1.90	0.75	1.58	1.97	0.00
time (sec)	N/A	0.118	0.089	0.185	0.273	0.260	0.568	0.284	0.000

Problem 387	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	98	191	174	79	133	128	0
N.S.	1	1.00	0.85	1.66	1.51	0.69	1.16	1.11	0.00
time (sec)	N/A	0.095	0.066	0.127	0.286	0.255	0.309	0.275	0.000

Problem 388	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	183	46	45	57	76	49	108
N.S.	1	1.00	3.21	0.81	0.79	1.00	1.33	0.86	1.89
time (sec)	N/A	0.047	0.103	0.174	0.275	0.257	0.128	0.281	0.789

Problem 389	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	214	214	221	0	0	0	0	0	0
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.276	0.102	0.000	0.000	0.000	0.000	0.000	0.000

Problem 390	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	90	81	89	0	280	0	0	0
N.S.	1	1.00	0.90	0.99	0.00	3.11	0.00	0.00	0.00
time (sec)	N/A	0.068	0.053	0.142	0.000	0.297	0.000	0.000	0.000

Problem 391	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	148	132	0	392	0	0	0
N.S.	1	1.00	1.08	0.96	0.00	2.86	0.00	0.00	0.00
time (sec)	N/A	0.097	0.373	0.122	0.000	0.327	0.000	0.000	0.000

Problem 392	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	174	245	0	496	0	0	0
N.S.	1	1.00	0.92	1.29	0.00	2.61	0.00	0.00	0.00
time (sec)	N/A	0.150	0.335	0.125	0.000	0.393	0.000	0.000	0.000

Problem 393	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	336	336	349	346	0	88	0	0	0
N.S.	1	1.00	1.04	1.03	0.00	0.26	0.00	0.00	0.00
time (sec)	N/A	0.296	0.426	1.194	0.000	0.099	0.000	0.000	0.000

Problem 394	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	307	295	0	72	0	0	0
N.S.	1	1.00	1.07	1.03	0.00	0.25	0.00	0.00	0.00
time (sec)	N/A	0.202	0.368	0.807	0.000	0.090	0.000	0.000	0.000

Problem 395	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	155	153	0	55	0	0	0
N.S.	1	1.00	0.65	0.65	0.00	0.23	0.00	0.00	0.00
time (sec)	N/A	0.161	10.097	0.618	0.000	0.091	0.000	0.000	0.000

Problem 396	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	140	114	0	17	0	0	0
N.S.	1	1.00	1.11	0.90	0.00	0.13	0.00	0.00	0.00
time (sec)	N/A	0.057	0.184	0.342	0.000	0.140	0.000	0.000	0.000

Problem 397	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	284	284	243	207	0	0	0	0	0
N.S.	1	1.00	0.86	0.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.175	0.266	0.552	0.000	0.000	0.000	0.000	0.000

Problem 398	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	355	355	370	346	0	0	0	0	0
N.S.	1	1.00	1.04	0.97	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.251	0.519	0.837	0.000	0.000	0.000	0.000	0.000

Problem 399	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	41	38	37	46	61	37	99
N.S.	1	1.00	0.87	0.81	0.79	0.98	1.30	0.79	2.11
time (sec)	N/A	0.040	0.022	0.071	0.278	0.243	0.236	0.278	0.767

Problem 400	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	B	A	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	39	57	80	39	109
N.S.	1	1.00	1.00	0.00	0.83	1.21	1.70	0.83	2.32
time (sec)	N/A	0.041	0.028	0.000	0.269	0.256	12.937	0.278	0.380

Problem 401	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	127	127	123	0	0	207	0	664	0
N.S.	1	1.00	0.97	0.00	0.00	1.63	0.00	5.23	0.00
time (sec)	N/A	0.023	0.068	0.000	0.000	0.261	0.000	1.028	0.000

Problem 402	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	110	110	162	0	0	144	0	370	0
N.S.	1	1.00	1.47	0.00	0.00	1.31	0.00	3.36	0.00
time (sec)	N/A	0.043	0.088	0.000	0.000	0.257	0.000	0.678	0.000

Problem 403	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	63	63	63	0	0	91	0	172	0
N.S.	1	1.00	1.00	0.00	0.00	1.44	0.00	2.73	0.00
time (sec)	N/A	0.009	0.013	0.000	0.000	0.255	0.000	0.416	0.000

Problem 404	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	43	43	41	45	45	48	0	55	39
N.S.	1	1.00	0.95	1.05	1.05	1.12	0.00	1.28	0.91
time (sec)	N/A	0.025	0.016	0.068	0.298	0.249	0.000	0.277	0.557

Problem 405	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	159	159	120	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.031	0.544	0.000	0.000	0.000	0.000	0.000	0.000

Problem 406	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	205	205	164	0	0	0	0	0	0
N.S.	1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.019	1.164	0.000	0.000	0.000	0.000	0.000	0.000

Problem 407	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	227	227	187	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.035	0.335	0.000	0.000	0.000	0.000	0.000	0.000

Problem 408	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	135	135	131	0	0	207	0	617	0
N.S.	1	1.00	0.97	0.00	0.00	1.53	0.00	4.57	0.00
time (sec)	N/A	0.025	0.076	0.000	0.000	0.261	0.000	1.005	0.000

Problem 409	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	115	115	166	0	0	144	0	346	0
N.S.	1	1.00	1.44	0.00	0.00	1.25	0.00	3.01	0.00
time (sec)	N/A	0.043	0.084	0.000	0.000	0.249	0.000	0.651	0.000

Problem 410	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	67	67	67	0	0	91	0	160	0
N.S.	1	1.00	1.00	0.00	0.00	1.36	0.00	2.39	0.00
time (sec)	N/A	0.011	0.026	0.000	0.000	0.252	0.000	0.438	0.000

Problem 411	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	45	45	48	0	50	39
N.S.	1	1.00	0.96	1.00	1.00	1.07	0.00	1.11	0.87
time (sec)	N/A	0.028	0.018	0.065	0.304	0.249	0.000	0.267	0.500

Problem 412	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	168	168	130	0	0	0	0	0	0
N.S.	1	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.016	0.210	0.000	0.000	0.000	0.000	0.000	0.000

Problem 413	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	216	216	183	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.018	0.532	0.000	0.000	0.000	0.000	0.000	0.000

Problem 414	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	240	240	195	0	0	0	0	0	0
N.S.	1	1.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.035	0.480	0.000	0.000	0.000	0.000	0.000	0.000

Problem 415	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	40	40	40	0	0	43	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.005	0.010	0.000	0.000	0.240	0.000	0.000	0.000

Problem 416	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	F	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	44	44	44	0	0	43	0	58	0
N.S.	1	1.00	1.00	0.00	0.00	0.98	0.00	1.32	0.00
time (sec)	N/A	0.008	0.011	0.000	0.000	0.254	0.000	0.277	0.000

Problem 417	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	277	277	269	0	0	0	0	0	0
N.S.	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.079	0.189	0.000	0.000	0.000	0.000	0.000	0.000

Problem 418	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	247	247	249	0	0	0	0	0	0
N.S.	1	1.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.045	0.240	0.000	0.000	0.000	0.000	0.000	0.000

Problem 419	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	210	210	207	0	0	0	0	0	0
N.S.	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.018	0.037	0.000	0.000	0.000	0.000	0.000	0.000

Problem 420	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	185	185	143	0	0	0	0	0	0
N.S.	1	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.016	0.027	0.000	0.000	0.000	0.000	0.000	0.000

Problem 421	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	238	238	238	0	0	0	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.027	0.444	0.000	0.000	0.000	0.000	0.000	0.000

Problem 422	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	261	261	247	0	0	0	0	0	0
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.043	0.364	0.000	0.000	0.000	0.000	0.000	0.000

Problem 423	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	317	317	297	0	0	0	0	0	0
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.048	0.569	0.000	0.000	0.000	0.000	0.000	0.000

Problem 424	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	299	299	292	0	0	0	0	0	0
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.094	0.213	0.000	0.000	0.000	0.000	0.000	0.000

Problem 425	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	267	267	265	0	0	0	0	0	0
N.S.	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.070	0.293	0.000	0.000	0.000	0.000	0.000	0.000

Problem 426	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	228	228	225	0	0	0	0	0	0
N.S.	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.020	0.041	0.000	0.000	0.000	0.000	0.000	0.000

Problem 427	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	201	201	155	0	0	0	0	0	0
N.S.	1	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.021	0.042	0.000	0.000	0.000	0.000	0.000	0.000

Problem 428	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	256	256	256	0	0	0	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.037	0.328	0.000	0.000	0.000	0.000	0.000	0.000

Problem 429	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	281	281	270	0	0	0	0	0	0
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.053	0.575	0.000	0.000	0.000	0.000	0.000	0.000

Problem 430	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	339	339	319	0	0	0	0	0	0
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.057	0.636	0.000	0.000	0.000	0.000	0.000	0.000

Problem 431	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	40	40	42	36	39	38	0	38	39
N.S.	1	1.00	1.05	0.90	0.98	0.95	0.00	0.95	0.98
time (sec)	N/A	0.034	0.185	2.125	1.082	0.292	0.000	0.921	0.707

Problem 432	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	275	275	0	1171	0	0	0	0	0
N.S.	1	1.00	0.00	4.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.154	0.000	3.272	0.000	0.000	0.000	0.000	0.000

Problem 433	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	205	205	0	657	0	0	0	0	0
N.S.	1	1.00	0.00	3.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.129	0.000	1.296	0.000	0.000	0.000	0.000	0.000

Problem 434	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	A	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	0	273	0	0	0	0	0
N.S.	1	1.00	0.00	1.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.000	0.754	0.000	0.000	0.000	0.000	0.000

Problem 435	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	40	40	42	36	39	48	61	38	39
N.S.	1	1.00	1.05	0.90	0.98	1.20	1.52	0.95	0.98
time (sec)	N/A	0.031	0.316	0.900	0.446	0.247	133.389	0.419	0.456

Problem 436	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	40	40	42	36	225	91	0	38	39
N.S.	1	1.00	1.05	0.90	5.62	2.28	0.00	0.95	0.98
time (sec)	N/A	0.031	3.156	0.806	1.893	0.248	0.000	0.542	1.289

Problem 437	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	22	18	17	17	17	17	17
N.S.	1	1.00	1.00	0.82	0.77	0.77	0.77	0.77	0.77
time (sec)	N/A	0.026	0.008	0.079	0.293	0.244	0.235	0.287	0.360

Problem 438	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	A	F	F(-2)	F	F	B
verified	N/A	Yes	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	0	170	0	0	0	0	70
N.S.	1	1.00	0.00	2.02	0.00	0.00	0.00	0.00	0.83
time (sec)	N/A	0.050	0.000	0.922	0.000	0.000	0.000	0.000	0.789

Problem 439	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	81	81	50	0	0	54	100	97	0
N.S.	1	1.00	0.62	0.00	0.00	0.67	1.23	1.20	0.00
time (sec)	N/A	0.045	0.124	0.000	0.000	0.255	0.511	0.295	0.000

Problem 440	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	82	82	50	0	0	45	80	76	0
N.S.	1	1.00	0.61	0.00	0.00	0.55	0.98	0.93	0.00
time (sec)	N/A	0.046	0.096	0.000	0.000	0.250	0.341	0.293	0.000

Problem 441	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	41	41	30	0	0	35	53	53	0
N.S.	1	1.00	0.73	0.00	0.00	0.85	1.29	1.29	0.00
time (sec)	N/A	0.026	0.033	0.000	0.000	0.265	0.219	0.282	0.000

Problem 442	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	39	39	31	0	0	26	32	31	0
N.S.	1	1.00	0.79	0.00	0.00	0.67	0.82	0.79	0.00
time (sec)	N/A	0.012	0.025	0.000	0.000	0.259	0.099	0.273	0.000

Problem 443	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	43	43	75	0	0	0	0	0	0
N.S.	1	1.00	1.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.043	0.042	0.000	0.000	0.000	0.000	0.000	0.000

Problem 444	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	83	83	54	0	0	0	0	0	0
N.S.	1	1.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.076	0.086	0.000	0.000	0.000	0.000	0.000	0.000

Problem 445	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	101	101	67	0	0	0	0	0	0
N.S.	1	1.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.089	0.067	0.000	0.000	0.000	0.000	0.000	0.000

Problem 446	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	129	129	84	0	0	0	0	0	0
N.S.	1	1.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.092	0.067	0.000	0.000	0.000	0.000	0.000	0.000

Problem 447	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	49	49	36	0	0	0	0	0	0
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.046	0.026	0.000	0.000	0.000	0.000	0.000	0.000

Problem 448	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	65	65	48	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.040	0.028	0.000	0.000	0.000	0.000	0.000	0.000

Problem 449	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	11	13	13	10	13	13
N.S.	1	1.00	1.17	0.92	1.08	1.08	0.83	1.08	1.08
time (sec)	N/A	0.029	0.168	0.034	0.420	0.247	0.361	0.314	0.252

Problem 450	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	11	13	13	12	13	13
N.S.	1	1.00	1.17	0.92	1.08	1.08	1.00	1.08	1.08
time (sec)	N/A	0.056	1.474	0.031	0.420	0.244	0.381	0.329	0.251

Problem 451	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	309	309	148	0	0	129	416	334	0
N.S.	1	1.00	0.48	0.00	0.00	0.42	1.35	1.08	0.00
time (sec)	N/A	0.391	0.349	0.000	0.000	0.271	0.613	0.296	0.000

Problem 452	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	205	205	103	0	0	85	243	208	0
N.S.	1	1.00	0.50	0.00	0.00	0.41	1.19	1.01	0.00
time (sec)	N/A	0.271	0.158	0.000	0.000	0.283	0.388	0.306	0.000

Problem 453	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	101	101	59	0	0	63	146	108	0
N.S.	1	1.00	0.58	0.00	0.00	0.62	1.45	1.07	0.00
time (sec)	N/A	0.138	0.132	0.000	0.000	0.273	0.305	0.305	0.000

Problem 454	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	51	51	35	0	0	39	65	43	0
N.S.	1	1.00	0.69	0.00	0.00	0.76	1.27	0.84	0.00
time (sec)	N/A	0.014	0.022	0.000	0.000	0.278	0.120	0.288	0.000

Problem 455	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	11	13	13	10	13	13
N.S.	1	1.00	1.17	0.92	1.08	1.08	0.83	1.08	1.08
time (sec)	N/A	0.145	0.135	0.033	0.452	0.267	0.367	0.362	0.298

Problem 456	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	12	14	11	13	13	12	13	13
N.S.	1	1.00	1.17	0.92	1.08	1.08	1.00	1.08	1.08
time (sec)	N/A	0.208	0.200	0.033	0.451	0.264	0.409	0.388	0.274

Problem 457	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	381	381	221	0	0	0	0	0	0
N.S.	1	1.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.514	0.285	0.000	0.000	0.000	0.000	0.000	0.000

Problem 458	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	265	265	161	0	0	0	0	0	0
N.S.	1	1.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.347	0.152	0.000	0.000	0.000	0.000	0.000	0.000

Problem 459	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	123	123	93	0	0	0	0	0	0
N.S.	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.192	0.124	0.000	0.000	0.000	0.000	0.000	0.000

Problem 460	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	69	69	52	0	0	0	0	0	0
N.S.	1	1.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.040	0.011	0.000	0.000	0.000	0.000	0.000	0.000

Problem 461	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	14	14	16	13	15	15	12	15	15
N.S.	1	1.00	1.14	0.93	1.07	1.07	0.86	1.07	1.07
time (sec)	N/A	0.152	0.156	0.029	0.483	0.246	0.421	0.375	0.279

Problem 462	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	14	14	16	13	15	15	14	15	15
N.S.	1	1.00	1.14	0.93	1.07	1.07	1.00	1.07	1.07
time (sec)	N/A	0.196	0.368	0.032	0.482	0.239	0.470	0.369	0.273

Problem 463	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	162	162	69	0	0	71	141	0	0
N.S.	1	1.00	0.43	0.00	0.00	0.44	0.87	0.00	0.00
time (sec)	N/A	0.305	0.334	0.000	0.000	0.267	13.730	0.000	0.000

Problem 464	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	112	112	51	0	0	55	95	0	0
N.S.	1	1.00	0.46	0.00	0.00	0.49	0.85	0.00	0.00
time (sec)	N/A	0.213	0.150	0.000	0.000	0.256	1.394	0.000	0.000

Problem 465	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	62	62	31	0	0	35	49	0	0
N.S.	1	1.00	0.50	0.00	0.00	0.56	0.79	0.00	0.00
time (sec)	N/A	0.148	0.084	0.000	0.000	0.262	0.140	0.000	0.000

Problem 466	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	10	10	10	10	9	9	8	9	9
N.S.	1	1.00	1.00	1.00	0.90	0.90	0.80	0.90	0.90
time (sec)	N/A	0.161	0.016	0.352	0.287	0.251	0.239	0.294	0.278

Problem 467	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	45	45	45	0	0	0	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.180	0.060	0.000	0.000	0.000	0.000	0.000	0.000

Problem 468	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	96	96	84	0	0	0	0	0	0
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.201	0.129	0.000	0.000	0.000	0.000	0.000	0.000

Problem 469	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	B	F	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	529	47	0	141	0	95	42
N.S.	1	1.00	11.26	1.00	0.00	3.00	0.00	2.02	0.89
time (sec)	N/A	0.025	2.784	0.592	0.000	0.261	0.000	0.318	0.740

Problem 470	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	F	A	F	A	A	F	F	F(-1)
verified	N/A	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	27	0	28	0	1	3	0	0	0
N.S.	1	0.00	1.04	0.00	0.04	0.11	0.00	0.00	0.00
time (sec)	N/A	0.000	0.475	0.000	0.287	0.232	0.000	0.000	0.000

Problem 471	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	38	38	38	0	0	41	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	1.08	0.00	0.00	0.00
time (sec)	N/A	0.044	0.040	0.000	0.000	0.264	0.000	0.000	0.000

Problem 472	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	F	B
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	30	30	26	0	0	28	0	0	26
N.S.	1	1.00	0.87	0.00	0.00	0.93	0.00	0.00	0.87
time (sec)	N/A	0.040	0.019	0.000	0.000	0.241	0.000	0.000	0.352

Problem 473	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	12	14	12	14	12
N.S.	1	1.00	1.00	1.06	0.75	0.88	0.75	0.88	0.75
time (sec)	N/A	0.020	0.019	0.486	0.275	0.249	0.105	0.272	0.337

Problem 474	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	F	A	A	F	A	F	A	B
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	0	22	17	0	14	0	20	12
N.S.	1	0.00	1.38	1.06	0.00	0.88	0.00	1.25	0.75
time (sec)	N/A	0.000	0.187	0.343	0.000	0.259	0.000	0.318	0.305

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [152] had the largest ratio of [1.19999999999999996]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	5	5	1.00	16	0.312
2	A	4	4	1.00	16	0.250
3	A	4	4	1.00	14	0.286
4	A	3	2	1.00	8	0.250
5	A	8	5	1.00	16	0.312
6	A	3	3	1.00	16	0.188
7	A	4	4	1.00	16	0.250
8	A	5	5	1.00	16	0.312
9	A	18	7	1.00	18	0.389
10	A	13	7	1.00	18	0.389
11	A	9	7	1.00	16	0.438
12	A	3	3	1.00	10	0.300
13	A	10	6	1.00	18	0.333
14	A	10	7	1.00	18	0.389
15	A	13	10	1.00	18	0.556
16	A	27	7	1.00	18	0.389
17	A	17	6	1.00	18	0.333
18	A	11	7	1.00	16	0.438
19	A	4	4	1.00	10	0.400
20	N/A	0	0	1.00	18	0.000
21	N/A	0	0	1.00	18	0.000
22	A	19	7	1.00	18	0.389
23	A	11	7	1.00	16	0.438
24	A	5	5	1.00	10	0.500

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
25	N/A	0	0	1.00	18	0.000
26	N/A	0	0	1.00	18	0.000
27	N/A	0	0	1.00	18	0.000
28	A	3	3	1.00	16	0.188
29	N/A	0	0	1.00	18	0.000
30	N/A	0	0	1.00	18	0.000
31	A	16	12	1.00	31	0.387
32	A	13	8	1.00	31	0.258
33	A	8	6	1.00	29	0.207
34	A	22	19	1.00	31	0.613
35	A	35	22	1.00	31	0.710
36	A	24	17	1.00	31	0.548
37	A	20	12	1.00	31	0.387
38	A	12	9	1.00	29	0.310
39	A	29	23	1.00	31	0.742
40	A	30	18	1.00	31	0.581
41	A	26	15	1.00	31	0.484
42	A	14	10	1.00	29	0.345
43	A	37	28	1.00	31	0.903
44	A	13	7	1.00	31	0.226
45	A	9	7	1.00	31	0.226
46	A	6	5	1.00	29	0.172
47	A	10	7	1.00	31	0.226
48	A	13	10	1.00	31	0.323
49	A	11	10	1.00	31	0.323
50	A	8	7	1.00	31	0.226
51	A	6	6	1.00	29	0.207
52	A	20	11	1.00	31	0.355
53	A	13	10	1.43	31	0.323
54	A	10	7	1.00	31	0.226
55	A	10	7	1.31	31	0.226
56	A	6	6	1.00	29	0.207
57	A	30	12	1.00	31	0.387
58	A	37	16	1.00	33	0.485

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
59	A	23	13	1.00	33	0.394
60	A	13	11	1.00	31	0.355
61	A	38	23	1.00	33	0.697
62	A	56	27	1.00	33	0.818
63	A	36	21	1.00	33	0.636
64	A	19	15	1.00	31	0.484
65	A	50	32	1.00	33	0.970
66	A	77	32	1.00	33	0.970
67	A	50	24	1.00	33	0.727
68	A	25	15	1.00	31	0.484
69	A	74	35	1.00	33	1.061
70	A	17	10	1.00	33	0.303
71	A	11	9	1.00	33	0.273
72	A	8	6	1.21	31	0.194
73	A	12	8	1.00	33	0.242
74	A	20	12	1.00	33	0.364
75	A	23	15	1.00	33	0.454
76	A	19	13	1.00	33	0.394
77	A	16	11	1.00	31	0.355
78	A	28	14	1.00	33	0.424
79	A	37	12	1.00	33	0.364
80	A	30	18	1.00	33	0.546
81	A	21	14	1.00	31	0.452
82	N/A	0	0	1.00	35	0.000
83	A	15	9	1.00	35	0.257
84	A	13	9	1.00	35	0.257
85	A	11	8	1.00	33	0.242
86	A	9	7	1.00	25	0.280
87	N/A	0	0	1.00	35	0.000
88	A	6	4	1.00	21	0.190
89	A	6	5	1.00	21	0.238
90	A	5	5	1.00	19	0.263
91	A	14	12	1.00	21	0.571
92	A	15	13	1.00	21	0.619
93	A	7	8	1.00	21	0.381

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
94	A	6	7	1.00	21	0.333
95	A	7	7	1.00	21	0.333
96	A	8	7	1.00	21	0.333
97	A	8	5	0.99	26	0.192
98	A	7	5	1.00	26	0.192
99	A	6	5	1.00	24	0.208
100	A	15	12	1.00	26	0.462
101	A	16	14	1.00	26	0.538
102	A	16	14	1.00	26	0.538
103	A	6	7	1.00	26	0.269
104	A	7	8	1.00	26	0.308
105	A	8	8	1.00	26	0.308
106	A	9	5	1.00	31	0.161
107	A	8	5	1.00	31	0.161
108	A	7	5	1.00	29	0.172
109	A	16	13	1.00	31	0.419
110	A	18	15	1.00	31	0.484
111	A	30	18	1.00	31	0.581
112	A	29	17	1.00	31	0.548
113	A	33	20	1.00	23	0.870
114	A	55	25	1.00	25	1.000
115	A	35	8	1.00	28	0.286
116	A	27	8	1.00	28	0.286
117	A	20	8	1.00	26	0.308
118	A	38	23	1.00	28	0.821
119	A	45	25	1.00	28	0.893
120	A	20	18	1.00	33	0.546
121	A	32	25	1.00	35	0.714
122	A	6	6	1.00	10	0.600
123	A	5	5	1.00	10	0.500
124	A	5	5	1.00	8	0.625
125	A	3	3	1.00	6	0.500
126	A	9	6	1.00	10	0.600
127	A	4	4	1.00	10	0.400
128	A	5	5	1.00	10	0.500

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
129	A	6	6	1.00	10	0.600
130	A	7	7	1.00	10	0.700
131	A	19	8	1.00	12	0.667
132	A	14	8	1.00	12	0.667
133	A	10	8	1.00	10	0.800
134	A	4	4	1.00	8	0.500
135	A	11	7	1.00	12	0.583
136	A	11	8	0.90	12	0.667
137	A	14	11	1.00	12	0.917
138	A	18	11	1.00	12	0.917
139	A	12	10	1.00	10	1.000
140	A	5	4	1.00	8	0.500
141	A	13	8	1.00	12	0.667
142	A	13	9	1.00	12	0.750
143	A	14	8	1.00	12	0.667
144	A	10	8	1.00	10	0.800
145	A	3	3	1.00	8	0.375
146	N/A	0	0	1.00	12	0.000
147	A	12	7	1.92	12	0.583
148	A	8	7	1.58	10	0.700
149	A	4	4	1.00	8	0.500
150	N/A	0	0	1.00	12	0.000
151	A	24	12	1.49	12	1.000
152	A	14	12	1.40	10	1.200
153	A	5	5	1.00	8	0.625
154	N/A	0	0	1.00	12	0.000
155	A	23	12	1.00	18	0.667
156	A	14	10	1.00	16	0.625
157	A	8	8	1.00	14	0.571
158	A	16	10	1.00	16	0.625
159	A	9	9	1.00	14	0.643
160	A	18	10	1.00	16	0.625
161	A	10	9	1.00	14	0.643
162	A	11	9	1.00	14	0.643
163	A	20	9	1.00	18	0.500

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
164	A	12	8	1.00	16	0.500
165	A	7	7	1.00	14	0.500
166	A	16	10	1.00	16	0.625
167	A	8	8	1.00	14	0.571
168	A	22	15	1.00	16	0.938
169	A	9	9	1.00	14	0.643
170	A	21	13	1.00	16	0.812
171	A	10	9	1.00	14	0.643
172	N/A	0	0	1.00	16	0.000
173	A	22	9	1.00	16	0.562
174	A	14	9	1.00	14	0.643
175	A	5	4	1.00	12	0.333
176	N/A	0	0	1.00	16	0.000
177	A	6	5	1.00	21	0.238
178	A	6	5	1.00	21	0.238
179	A	6	5	1.00	21	0.238
180	A	5	5	1.00	19	0.263
181	A	4	3	1.00	10	0.300
182	A	7	7	1.00	21	0.333
183	A	6	6	1.00	21	0.286
184	A	4	4	1.00	21	0.190
185	A	7	7	1.00	21	0.333
186	A	5	5	1.00	21	0.238
187	A	8	7	1.00	21	0.333
188	A	9	7	1.00	23	0.304
189	A	8	6	1.00	23	0.261
190	A	7	7	1.00	23	0.304
191	A	6	6	1.00	21	0.286
192	A	4	4	1.00	12	0.333
193	A	8	8	1.00	23	0.348
194	A	9	7	1.00	23	0.304
195	A	5	5	1.00	23	0.217
196	A	11	9	1.00	23	0.391
197	A	17	9	1.00	23	0.391
198	A	13	7	1.00	23	0.304

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
199	A	12	9	1.00	23	0.391
200	A	8	7	1.00	21	0.333
201	A	6	4	1.00	12	0.333
202	A	9	9	1.00	23	0.391
203	A	11	8	1.00	23	0.348
204	A	9	9	1.00	23	0.391
205	A	16	12	1.00	23	0.522
206	A	16	6	1.00	23	0.261
207	A	13	8	1.00	23	0.348
208	A	9	6	1.00	21	0.286
209	A	6	4	1.00	12	0.333
210	A	10	9	1.00	23	0.391
211	A	13	9	1.00	23	0.391
212	A	10	10	1.00	23	0.435
213	A	21	12	1.00	23	0.522
214	A	8	4	1.00	12	0.333
215	A	14	7	1.00	23	0.304
216	A	11	7	1.00	23	0.304
217	A	11	7	1.00	23	0.304
218	A	8	7	1.00	21	0.333
219	A	5	5	1.00	12	0.417
220	N/A	0	0	1.00	23	0.000
221	A	13	6	1.00	23	0.261
222	A	10	6	1.00	23	0.261
223	A	10	6	1.00	23	0.261
224	A	6	6	1.00	21	0.286
225	A	6	6	1.00	12	0.500
226	N/A	0	0	1.00	23	0.000
227	A	26	9	1.00	23	0.391
228	A	20	9	1.00	23	0.391
229	A	18	10	1.00	23	0.435
230	A	11	10	1.00	21	0.476
231	A	7	7	1.00	12	0.583
232	N/A	0	0	1.00	23	0.000
233	A	24	8	1.00	23	0.348

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
234	A	17	8	1.00	23	0.348
235	A	18	10	1.00	23	0.435
236	A	9	9	1.00	21	0.429
237	A	8	7	1.00	12	0.583
238	N/A	0	0	1.00	23	0.000
239	A	9	7	1.00	12	0.583
240	A	16	10	1.00	25	0.400
241	A	16	10	1.00	25	0.400
242	A	11	10	1.00	23	0.435
243	A	8	8	1.00	14	0.571
244	N/A	0	0	1.00	25	0.000
245	A	27	12	1.00	25	0.480
246	A	24	13	1.00	25	0.520
247	A	13	12	1.00	23	0.522
248	A	9	9	1.00	14	0.643
249	N/A	0	0	1.00	25	0.000
250	A	29	12	1.00	25	0.480
251	A	26	13	1.00	25	0.520
252	A	14	12	1.00	23	0.522
253	A	10	9	1.00	14	0.643
254	N/A	0	0	1.00	25	0.000
255	A	35	14	1.00	25	0.560
256	A	16	12	1.00	23	0.522
257	A	11	9	1.00	14	0.643
258	N/A	0	0	1.00	25	0.000
259	A	20	9	1.00	25	0.360
260	A	15	9	1.00	25	0.360
261	A	15	9	1.00	25	0.360
262	A	10	9	1.00	23	0.391
263	A	7	7	1.00	14	0.500
264	N/A	0	0	1.00	25	0.000
265	A	19	8	1.00	25	0.320
266	A	14	8	1.00	25	0.320
267	A	14	8	1.00	25	0.320

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
268	A	8	8	1.00	23	0.348
269	A	8	8	1.00	14	0.571
270	N/A	0	0	1.00	25	0.000
271	A	26	11	1.00	25	0.440
272	A	24	12	1.00	25	0.480
273	A	13	12	1.00	23	0.522
274	A	9	9	1.00	14	0.643
275	N/A	0	0	1.00	25	0.000
276	A	23	10	1.00	25	0.400
277	A	24	12	1.00	25	0.480
278	A	11	11	1.00	23	0.478
279	A	10	9	1.00	14	0.643
280	N/A	0	0	1.00	25	0.000
281	A	7	6	1.00	23	0.261
282	A	6	5	1.00	23	0.217
283	A	6	6	1.00	23	0.261
284	A	5	5	1.00	23	0.217
285	A	5	5	1.00	23	0.217
286	A	4	4	1.00	23	0.174
287	A	6	6	1.00	23	0.261
288	A	5	5	1.00	23	0.217
289	A	7	6	1.00	23	0.261
290	A	6	5	1.00	23	0.217
291	A	3	3	1.00	25	0.120
292	A	3	3	1.00	25	0.120
293	A	3	3	1.00	25	0.120
294	A	3	3	1.00	25	0.120
295	A	3	3	1.00	25	0.120
296	A	3	3	1.00	25	0.120
297	A	3	3	1.00	25	0.120
298	A	3	3	1.00	25	0.120
299	A	3	3	1.00	25	0.120
300	N/A	0	0	1.00	25	0.000
301	N/A	0	0	1.00	25	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
302	N/A	0	0	1.00	25	0.000
303	N/A	0	0	1.00	25	0.000
304	N/A	0	0	1.00	25	0.000
305	N/A	0	0	1.00	25	0.000
306	N/A	0	0	1.00	25	0.000
307	N/A	0	0	1.00	25	0.000
308	N/A	0	0	1.00	23	0.000
309	N/A	0	0	1.00	23	0.000
310	A	3	3	1.00	23	0.130
311	A	3	3	1.00	21	0.143
312	N/A	0	0	1.00	23	0.000
313	A	7	6	1.00	33	0.182
314	A	6	6	1.00	33	0.182
315	A	4	4	1.00	31	0.129
316	A	5	4	1.00	33	0.121
317	A	6	6	1.00	33	0.182
318	A	4	4	1.03	33	0.121
319	A	9	9	1.00	33	0.273
320	A	15	9	1.00	33	0.273
321	A	11	9	1.00	33	0.273
322	A	7	6	1.00	31	0.194
323	A	6	4	1.00	33	0.121
324	A	7	5	1.00	33	0.152
325	A	11	8	1.00	33	0.242
326	A	18	7	1.00	33	0.212
327	A	2	2	1.00	33	0.061
328	A	2	2	1.00	33	0.061
329	A	2	2	1.00	31	0.065
330	A	2	2	1.00	33	0.061
331	A	2	2	1.00	33	0.061
332	A	2	2	1.00	33	0.061
333	A	8	8	1.00	33	0.242
334	A	7	7	1.00	33	0.212
335	A	3	3	1.00	31	0.097

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
336	N/A	0	0	1.00	33	0.000
337	N/A	0	0	1.00	33	0.000
338	A	2	4	1.00	23	0.174
339	A	2	2	1.00	36	0.056
340	A	5	4	1.00	14	0.286
341	A	6	5	1.00	14	0.357
342	A	5	4	1.00	14	0.286
343	A	5	5	1.00	14	0.357
344	A	4	3	1.00	12	0.250
345	A	7	6	1.00	14	0.429
346	A	5	5	1.00	14	0.357
347	A	3	3	1.00	14	0.214
348	A	6	6	1.00	14	0.429
349	A	4	4	1.00	14	0.286
350	A	7	6	1.00	14	0.429
351	A	5	4	1.00	14	0.286
352	A	5	4	1.00	14	0.286
353	A	7	7	1.00	14	0.500
354	A	4	4	1.00	14	0.286
355	A	7	6	1.00	10	0.600
356	A	3	3	1.00	14	0.214
357	A	7	7	1.00	14	0.500
358	A	4	4	1.00	14	0.286
359	A	8	7	1.00	14	0.500
360	A	5	5	1.00	10	0.500
361	A	8	6	1.00	10	0.600
362	A	7	6	1.00	8	0.750
363	A	6	6	1.00	6	1.000
364	A	5	5	1.00	10	0.500
365	A	3	3	1.00	10	0.300
366	A	4	4	1.00	10	0.400
367	A	5	4	1.00	10	0.400
368	A	6	4	1.00	10	0.400
369	A	7	6	1.00	14	0.429
370	A	4	4	1.00	14	0.286

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
371	A	6	6	1.00	14	0.429
372	A	3	3	1.00	12	0.250
373	A	6	5	1.00	10	0.500
374	A	7	6	1.00	14	0.429
375	A	4	3	1.00	14	0.214
376	A	5	5	1.00	14	0.357
377	A	5	4	1.00	14	0.286
378	A	6	5	1.00	14	0.357
379	A	3	3	1.00	14	0.214
380	A	3	3	1.00	14	0.214
381	A	3	3	1.00	12	0.250
382	A	4	3	1.00	10	0.300
383	A	7	6	1.00	14	0.429
384	A	3	3	1.00	14	0.214
385	A	3	3	1.00	14	0.214
386	A	7	7	1.00	16	0.438
387	A	7	7	1.00	16	0.438
388	A	5	4	1.00	14	0.286
389	A	12	7	1.00	16	0.438
390	A	5	5	1.00	16	0.312
391	A	6	6	1.00	16	0.375
392	A	7	7	1.00	16	0.438
393	A	8	8	1.00	16	0.500
394	A	7	7	1.00	16	0.438
395	A	7	6	1.00	12	0.500
396	A	4	4	1.00	16	0.250
397	A	8	7	1.00	16	0.438
398	A	8	8	1.00	16	0.500
399	A	4	4	1.00	12	0.333
400	A	4	4	1.00	14	0.286
401	A	3	2	1.00	14	0.143
402	A	5	4	1.00	14	0.286
403	A	2	2	1.00	14	0.143
404	A	4	3	1.00	12	0.250
405	A	1	1	1.00	14	0.071

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
406	A	1	1	1.00	14	0.071
407	A	2	2	1.00	14	0.143
408	A	3	2	1.00	16	0.125
409	A	5	4	1.00	16	0.250
410	A	2	2	1.00	16	0.125
411	A	4	3	1.00	14	0.214
412	A	1	1	1.00	16	0.062
413	A	1	1	1.00	16	0.062
414	A	2	2	1.00	16	0.125
415	A	2	2	1.00	8	0.250
416	A	2	2	1.00	10	0.200
417	A	2	2	1.00	16	0.125
418	A	2	2	1.00	16	0.125
419	A	1	1	1.00	16	0.062
420	A	1	1	1.00	16	0.062
421	A	1	1	1.00	16	0.062
422	A	2	2	1.00	16	0.125
423	A	2	2	1.00	16	0.125
424	A	2	2	1.00	18	0.111
425	A	2	2	1.00	18	0.111
426	A	1	1	1.00	18	0.056
427	A	1	1	1.00	18	0.056
428	A	1	1	1.00	18	0.056
429	A	2	2	1.00	18	0.111
430	A	2	2	1.00	18	0.111
431	N/A	0	0	1.00	40	0.000
432	A	8	8	1.00	40	0.200
433	A	7	7	1.00	40	0.175
434	A	6	7	1.00	38	0.184
435	N/A	0	0	1.00	40	0.000
436	N/A	0	0	1.00	40	0.000
437	A	3	4	1.00	8	0.500
438	A	6	6	1.00	10	0.600
439	A	6	4	1.00	10	0.400
440	A	6	4	1.00	10	0.400

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
441	A	5	4	1.00	8	0.500
442	A	2	2	1.00	6	0.333
443	A	6	5	1.00	10	0.500
444	A	6	4	1.00	10	0.400
445	A	12	5	1.00	12	0.417
446	A	12	5	1.00	12	0.417
447	A	8	5	1.00	10	0.500
448	A	7	4	1.00	8	0.500
449	N/A	0	0	1.00	12	0.000
450	N/A	0	0	1.00	12	0.000
451	A	17	7	1.00	12	0.583
452	A	13	7	1.00	12	0.583
453	A	9	7	1.00	10	0.700
454	A	2	2	1.00	8	0.250
455	N/A	0	0	1.00	12	0.000
456	N/A	0	0	1.00	12	0.000
457	A	37	8	1.00	14	0.571
458	A	27	8	1.00	14	0.571
459	A	17	8	1.00	12	0.667
460	A	7	4	1.00	10	0.400
461	N/A	0	0	1.00	14	0.000
462	N/A	0	0	1.00	14	0.000
463	A	7	5	1.00	21	0.238
464	A	6	5	1.00	21	0.238
465	A	5	5	1.00	21	0.238
466	A	4	4	1.00	21	0.190
467	A	4	4	1.00	21	0.190
468	A	5	5	1.00	21	0.238
469	A	6	6	1.00	10	0.600
470	F	0	0	N/A	0.000	N/A
471	A	2	2	1.00	26	0.077
472	A	2	2	1.00	26	0.077
473	A	3	2	1.00	28	0.071
474	F	0	0	N/A	0.000	N/A

CHAPTER 3

LISTING OF INTEGRALS

3.1 $\int (d+ex)^3(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 179

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx = \frac{7bd(d+ex)^2\sqrt{1-c^2x^2}}{48c}+\frac{b(d+ex)^3\sqrt{1-c^2x^2}}{16c}+\frac{b(4d(19c^2d^2+16e^2)+e(26c^2d^2+9e^2)\,x)\sqrt{1-c^2x^2}}{96c^3}-\frac{b(8c^4d^4+24c^2d^2e^2+3e^4)\arcsin(cx)}{32c^4e}+\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}$$

```
[Out] -1/32*b*(8*c^4*d^4+24*c^2*d^2*e^2+3*e^4)*arcsin(c*x)/c^4/e+1/4*(e*x+d)^4*(a
+b*arcsin(c*x))/e+7/48*b*d*(e*x+d)^2*(-c^2*x^2+1)^(1/2)/c+1/16*b*(e*x+d)^3*
(-c^2*x^2+1)^(1/2)/c+1/96*b*(4*d*(19*c^2*d^2+16*e^2)+e*(26*c^2*d^2+9*e^2)*x
)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4827, 757, 847, 794, 222}

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx = \frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{b\arcsin(cx)\,(8c^4d^4+24c^2d^2e^2+3e^4)}{32c^4e}+\frac{b\sqrt{1-c^2x^2}(d+ex)^3}{16c}+\frac{7bd\sqrt{1-c^2x^2}(d+ex)^2}{48c}+\frac{b\sqrt{1-c^2x^2}(ex(26c^2d^2+9e^2)+4d(19c^2d^2+16e^2))}{96c^3}$$

```
[In] Int[(d + e*x)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (7*b*d*(d + e*x)^2*Sqrt[1 - c^2*x^2])/(48*c) + (b*(d + e*x)^3*Sqrt[1 - c^2*
x^2])/(16*c) + (b*(4*d*(19*c^2*d^2 + 16*e^2) + e*(26*c^2*d^2 + 9*e^2)*x)*Sq
rt[1 - c^2*x^2])/(96*c^3) - (b*(8*c^4*d^4 + 24*c^2*d^2*e^2 + 3*e^4)*ArcSin[
c*x])/(32*c^4*e) + ((d + e*x)^4*(a + b*ArcSin[c*x]))/(4*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 847

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 2))
), x] + Dist[1/(c*(m + 2*p + 2)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p*Simp[
c*d*f*(m + 2*p + 2) - a*e*g*m + c*(e*f*(m + 2*p + 2) + d*g*m)*x, x], x], x]
 /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[m, 0] &
& NeQ[m + 2*p + 2, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(d+ex)^4(a+b\arcsin(cx))}{4e} - \frac{(bc)\int \frac{(d+ex)^4}{\sqrt{1-c^2x^2}}\,dx}{4e} \\
&= \frac{b(d+ex)^3\sqrt{1-c^2x^2}}{16c} + \frac{(d+ex)^4(a+b\arcsin(cx))}{4e} + \frac{b\int \frac{(d+ex)^2(-4c^2d^2-3e^2-7c^2dex)}{\sqrt{1-c^2x^2}}\,dx}{16ce} \\
&= \frac{7bd(d+ex)^2\sqrt{1-c^2x^2}}{48c} + \frac{b(d+ex)^3\sqrt{1-c^2x^2}}{16c} \\
&\quad + \frac{(d+ex)^4(a+b\arcsin(cx))}{4e} - \frac{b\int \frac{(d+ex)(c^2d(12c^2d^2+23e^2)+c^2e(26c^2d^2+9e^2)x)}{\sqrt{1-c^2x^2}}\,dx}{48c^3e} \\
&= \frac{7bd(d+ex)^2\sqrt{1-c^2x^2}}{48c} + \frac{b(d+ex)^3\sqrt{1-c^2x^2}}{16c} \\
&\quad + \frac{b(4d(19c^2d^2+16e^2)+e(26c^2d^2+9e^2)x)\sqrt{1-c^2x^2}}{96c^3} \\
&\quad + \frac{(d+ex)^4(a+b\arcsin(cx))}{4e} - \frac{(b(8c^4d^4+24c^2d^2e^2+3e^4))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3e} \\
&= \frac{7bd(d+ex)^2\sqrt{1-c^2x^2}}{48c} + \frac{b(d+ex)^3\sqrt{1-c^2x^2}}{16c} \\
&\quad + \frac{b(4d(19c^2d^2+16e^2)+e(26c^2d^2+9e^2)x)\sqrt{1-c^2x^2}}{96c^3} \\
&\quad - \frac{b(8c^4d^4+24c^2d^2e^2+3e^4)\arcsin(cx)}{32c^4e} + \frac{(d+ex)^4(a+b\arcsin(cx))}{4e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.92

$$
\int (d+ex)^3(a+b\arcsin(cx))\,dx
= \frac{24ac^4x(4d^3+6d^2ex+4de^2x^2+e^3x^3)+bc\sqrt{1-c^2x^2}(e^2(64d+9ex)+c^2(96d^3+72d^2ex+32de^2x^2+6e^3}{96c^4}
$$

```
[In] Integrate[(d + e*x)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*a*c^4*x*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3) + b*c*Sqrt[1 - c^2*
x^2]*(e^2*(64*d + 9*e*x) + c^2*(96*d^3 + 72*d^2*e*x + 32*d*e^2*x^2 + 6*e^3*
x^3)) + 3*b*(-24*c^2*d^2*e - 3*e^3 + 8*c^4*x*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x
^2 + e^3*x^3))*ArcSin[c*x])/(96*c^4)
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.39

method	result
parts	$\frac{a(ex+d)^4}{4e} + \frac{b\left(\frac{c e^3 \arcsin(cx) x^4}{4} + c e^2 \arcsin(cx) x^3 d + \frac{3c \arcsin(cx) d^2 e x^2}{2} + \arcsin(cx) d^3 cx + \frac{c \arcsin(cx) d^4}{4e} - \frac{c^4 d^4 \arcsin(cx) +}{}\right.}{}$
derivativedivides	$\frac{a(cex+dc)^4}{4c^3 e} + \frac{b\left(\frac{\arcsin(cx) c^4 d^4}{4e} + \arcsin(cx) c^4 d^3 x + \frac{3e \arcsin(cx) c^4 d^2 x^2}{2} + e^2 \arcsin(cx) c^4 d x^3 + \frac{\arcsin(cx) e^3 c^4 x^4}{4} - \frac{c^4 d^4 \arcsin(cx) + e^4}{}\right.}{}$
default	$\frac{a(cex+dc)^4}{4c^3 e} + \frac{b\left(\frac{\arcsin(cx) c^4 d^4}{4e} + \arcsin(cx) c^4 d^3 x + \frac{3e \arcsin(cx) c^4 d^2 x^2}{2} + e^2 \arcsin(cx) c^4 d x^3 + \frac{\arcsin(cx) e^3 c^4 x^4}{4} - \frac{c^4 d^4 \arcsin(cx) + e^4}{}\right.}{}$

```
[In] int((e*x+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a*(e*x+d)^4/e+b/c*(1/4*c*e^3*arcsin(c*x)*x^4+c*e^2*arcsin(c*x)*x^3*d+3/
2*c*arcsin(c*x)*d^2*e*x^2+arcsin(c*x)*d^3*c*x+1/4*c/e*arcsin(c*x)*d^4-1/4/c
^3/e*(c^4*d^4*arcsin(c*x)+e^4*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^
2*x^2+1)^(1/2)+3/8*arcsin(c*x))-4*d^3*c^3*e*(-c^2*x^2+1)^(1/2)+6*d^2*c^2*e^
2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+4*d*c*e^3*(-1/3*c^2*x^2*(-c
^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.12

$$\int (d+ex)^3 (a + b\arcsin(cx))\,dx$$
$$= \frac{24\,ac^4e^3x^4 + 96\,ac^4de^2x^3 + 144\,ac^4d^2ex^2 + 96\,ac^4d^3x + 3\,(8\,bc^4e^3x^4 + 32\,bc^4de^2x^3 + 48\,bc^4d^2ex^2 + 32\,bc^4d^3}{}$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/96*(24*a*c^4*e^3*x^4 + 96*a*c^4*d*e^2*x^3 + 144*a*c^4*d^2*e*x^2 + 96*a*c^
4*d^3*x + 3*(8*b*c^4*e^3*x^4 + 32*b*c^4*d*e^2*x^3 + 48*b*c^4*d^2*e*x^2 + 32
*b*c^4*d^3*x - 24*b*c^2*d^2*e - 3*b*e^3)*arcsin(c*x) + (6*b*c^3*e^3*x^3 + 3
2*b*c^3*d*e^2*x^2 + 96*b*c^3*d^3 + 64*b*c*d*e^2 + 9*(8*b*c^3*d^2*e + b*c*e^
3)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.77

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^3x + \frac{3ad^2ex^2}{2} + ade^2x^3 + \frac{ae^3x^4}{4} + bd^3x\operatorname{asin}(cx) + \frac{3bd^2ex^2\operatorname{asin}(cx)}{2} + bde^2x^3\operatorname{asin}(cx) + \frac{be^3x^4\operatorname{asin}(cx)}{4} + \frac{bd^3\sqrt{\ldots}}{} \\ a\left(d^3x + \frac{3d^2ex^2}{2} + de^2x^3 + \frac{e^3x^4}{4}\right) \end{cases}$$

```
[In] integrate((e*x+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x + 3*a*d**2*e*x**2/2 + a*d*e**2*x**3 + a*e**3*x**4/4 + b
*d**3*x*asin(c*x) + 3*b*d**2*e*x**2*asin(c*x)/2 + b*d*e**2*x**3*asin(c*x) +
 b*e**3*x**4*asin(c*x)/4 + b*d**3*sqrt(-c**2*x**2 + 1)/c + 3*b*d**2*e*x*sqr
t(-c**2*x**2 + 1)/(4*c) + b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + b*e**3
*x**3*sqrt(-c**2*x**2 + 1)/(16*c) - 3*b*d**2*e*asin(c*x)/(4*c**2) + 2*b*d*e
**2*sqrt(-c**2*x**2 + 1)/(3*c**3) + 3*b*e**3*x*sqrt(-c**2*x**2 + 1)/(32*c**
3) - 3*b*e**3*asin(c*x)/(32*c**4), Ne(c, 0)), (a*(d**3*x + 3*d**2*e*x**2/2
+ d*e**2*x**3 + e**3*x**4/4), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.29

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}ae^3x^4 + ade^2x^3 + \frac{3}{2}ad^2ex^2$$
$$+ \frac{3}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2e$$
$$+ \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2$$
$$+ \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3$$
$$+ ad^3x + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3}{c}$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e^3*x^4 + a*d*e^2*x^3 + 3/2*a*d^2*e*x^2 + 3/4*(2*x^2*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e + 1/3*(3*x^3*arcsin(c
```

```
*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e^2 +
1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 +
 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3 + a*d^3*x + (c*x*arcsin(c*x) + sqrt
(-c^2*x^2 + 1))*b*d^3/c
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.77

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx = \frac{1}{4}\,ae^3x^4 + ade^2x^3 + bd^3x\arcsin(cx) + ad^3x + \frac{(c^2x^2-1)bde^2x\arcsin(cx)}{c^2} + \frac{3\sqrt{-c^2x^2+1}bd^2ex}{4\,c} + \frac{3\,(c^2x^2-1)bd^2e\arcsin(cx)}{2\,c^2} + \frac{bde^2x\arcsin(cx)}{c^2} + \frac{\sqrt{-c^2x^2+1}bd^3}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^3x}{16\,c^3} + \frac{3\,(c^2x^2-1)ad^2e}{2\,c^2} + \frac{3\,bd^2e\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2be^3\arcsin(cx)}{4\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bde^2}{3\,c^3} + \frac{5\sqrt{-c^2x^2+1}be^3x}{32\,c^3} + \frac{(c^2x^2-1)be^3\arcsin(cx)}{2\,c^4} + \frac{\sqrt{-c^2x^2+1}bde^2}{c^3} + \frac{5\,be^3\arcsin(cx)}{32\,c^4}$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*a*e^3*x^4 + a*d*e^2*x^3 + b*d^3*x*arcsin(c*x) + a*d^3*x + (c^2*x^2 - 1)
*b*d*e^2*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*x/c + 3/2*(c^2*
x^2 - 1)*b*d^2*e*arcsin(c*x)/c^2 + b*d*e^2*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^
2 + 1)*b*d^3/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*x/c^3 + 3/2*(c^2*x^2 - 1)*
a*d^2*e/c^2 + 3/4*b*d^2*e*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*arcsi
n(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^3 + 5/32*sqrt(-c^2*x^2 + 1)
*b*e^3*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^3*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)
*b*d*e^2/c^3 + 5/32*b*e^3*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^3\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^3,x)
[Out] int((a + b*asin(c*x))*(d + e*x)^3, x)
```

3.2 $\int (d+ex)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 124

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx = \frac{b(d+ex)^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(4c^2d^2+e^2)+5c^2dex)\sqrt{1-c^2x^2}}{18c^3} - \frac{bd\left(2d^2+\frac{3e^2}{c^2}\right)\arcsin(cx)}{6e} + \frac{(d+ex)^3(a+b\arcsin(cx))}{3e}$$

```
[Out] -1/6*b*d*(2*d^2+3*e^2/c^2)*arcsin(c*x)/e+1/3*(e*x+d)^3*(a+b*arcsin(c*x))/e+
1/9*b*(e*x+d)^2*(-c^2*x^2+1)^(1/2)/c+1/18*b*(5*c^2*d*e*x+16*c^2*d^2+4*e^2)*
(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4827, 757, 794, 222}

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx = \frac{(d+ex)^3(a+b\arcsin(cx))}{3e} - \frac{bd\arcsin(cx)\left(\frac{3e^2}{c^2}+2d^2\right)}{6e} + \frac{b\sqrt{1-c^2x^2}(d+ex)^2}{9c} + \frac{b\sqrt{1-c^2x^2}(4(4c^2d^2+e^2)+5c^2dex)}{18c^3}$$

```
[In] Int[(d + e*x)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(d + e*x)^2*Sqrt[1 - c^2*x^2])/(9*c) + (b*(4*(4*c^2*d^2 + e^2) + 5*c^2*d
*e*x)*Sqrt[1 - c^2*x^2])/(18*c^3) - (b*d*(2*d^2 + (3*e^2)/c^2)*ArcSin[c*x])
/(6*e) + ((d + e*x)^3*(a + b*ArcSin[c*x]))/(3*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(d+ex)^3(a+b\arcsin(cx))}{3e} - \frac{(bc)\int \frac{(d+ex)^3}{\sqrt{1-c^2x^2}}\,dx}{3e} \\
&= \frac{b(d+ex)^2\sqrt{1-c^2x^2}}{9c} + \frac{(d+ex)^3(a+b\arcsin(cx))}{3e} + \frac{b\int \frac{(d+ex)(-3c^2d^2-2e^2-5c^2dex)}{\sqrt{1-c^2x^2}}\,dx}{9ce} \\
&= \frac{b(d+ex)^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(4c^2d^2+e^2)+5c^2dex)\sqrt{1-c^2x^2}}{18c^3} \\
&\quad + \frac{(d+ex)^3(a+b\arcsin(cx))}{3e} - \frac{1}{6}\left(bd\left(\frac{2cd^2}{e}+\frac{3e}{c}\right)\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= \frac{b(d+ex)^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(4c^2d^2+e^2)+5c^2dex)\sqrt{1-c^2x^2}}{18c^3} - \frac{bd\left(2d^2+\frac{3e^2}{c^2}\right)\arcsin(cx)}{6e} + \frac{(d+ex)^3(a+b\arcsin(cx))}{3e}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.98

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx$$
$$= \frac{6ac^3x(3d^2+3dex+e^2x^2)+b\sqrt{1-c^2x^2}(4e^2+c^2(18d^2+9dex+2e^2x^2))+3bc(6c^2d^2x+2c^2e^2x^3+3de(-\cdots}{18c^3}$$

[In] Integrate[(d + e*x)^2*(a + b*ArcSin[c*x]),x]

[Out] (6*a*c^3*x*(3*d^2 + 3*d*e*x + e^2*x^2) + b*Sqrt[1 - c^2*x^2]*(4*e^2 + c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)) + 3*b*c*(6*c^2*d^2*x + 2*c^2*e^2*x^3 + 3*d*e*(-1 + 2*c^2*x^2))*ArcSin[c*x])/(18*c^3)

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.44

method	result
parts	$\frac{a(ex+d)^3}{3e} + \frac{b\left(\frac{c\,e^2\arcsin(cx)x^3}{3}+c\arcsin(cx)ed\,x^2+\arcsin(cx)d^2cx+\frac{c\arcsin(cx)d^3}{3e}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}\cdots\right.}{\cdots}\right.}{c}$
derivativedivides	$\frac{\frac{a(cex+dc)^3}{3c^2e}+\frac{b\left(\frac{\arcsin(cx)c^3d^3}{3e}+\arcsin(cx)c^3d^2x+e\arcsin(cx)c^3d\,x^2+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\cdots\right.}{\cdots}\right.}{c^2}}{c}$
default	$\frac{\frac{a(cex+dc)^3}{3c^2e}+\frac{b\left(\frac{\arcsin(cx)c^3d^3}{3e}+\arcsin(cx)c^3d^2x+e\arcsin(cx)c^3d\,x^2+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\cdots\right.}{\cdots}\right.}{c^2}}{c}$

[In] int((e*x+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/3*a*(e*x+d)^3/e+b/c*(1/3*c*e^2*arcsin(c*x)*x^3+c*arcsin(c*x)*e*d*x^2+arcsin(c*x)*d^2*c*x+1/3*c/e*arcsin(c*x)*d^3-1/3/c^2/e*(c^3*d^3*arcsin(c*x)+e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3*(-c^2*x^2+1)^(1/2)*c^2*d^2*e+3*d*c*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.09

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx$$
$$= \frac{6\,ac^3e^2x^3 + 18\,ac^3dex^2 + 18\,ac^3d^2x + 3\,(2\,bc^3e^2x^3 + 6\,bc^3dex^2 + 6\,bc^3d^2x - 3\,bcde)\arcsin(cx) + (2\,bc^2e^2x}{18\,c^3}$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^3*e^2*x^3 + 18*a*c^3*d*e*x^2 + 18*a*c^3*d^2*x + 3*(2*b*c^3*e^2*
x^3 + 6*b*c^3*d*e*x^2 + 6*b*c^3*d^2*x - 3*b*c*d*e)*arcsin(c*x) + (2*b*c^2*e
^2*x^2 + 9*b*c^2*d*e*x + 18*b*c^2*d^2 + 4*b*e^2)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.53

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2x + adex^2 + \frac{ae^2x^3}{3} + bd^2x\operatorname{asin}(cx) + bdex^2\operatorname{asin}(cx) + \frac{be^2x^3\operatorname{asin}(cx)}{3} + \frac{bd^2\sqrt{-c^2x^2+1}}{c} + \frac{bdex\sqrt{-c^2x^2+1}}{2c} + \frac{be \\ a\left(d^2x + dex^2 + \frac{e^2x^3}{3}\right) \end{cases}$$

```
[In] integrate((e*x+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x + a*d*e*x**2 + a*e**2*x**3/3 + b*d**2*x*asin(c*x) + b*d
*e*x**2*asin(c*x) + b*e**2*x**3*asin(c*x)/3 + b*d**2*sqrt(-c**2*x**2 + 1)/c
 + b*d*e*x*sqrt(-c**2*x**2 + 1)/(2*c) + b*e**2*x**2*sqrt(-c**2*x**2 + 1)/(9
*c) - b*d*e*asin(c*x)/(2*c**2) + 2*b*e**2*sqrt(-c**2*x**2 + 1)/(9*c**3), Ne
(c, 0)), (a*(d**2*x + d*e*x**2 + e**2*x**3/3), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.21

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{3}ae^2x^3 + adex^2 + \frac{1}{2}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bde$$
$$+ \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2$$
$$+ ad^2x + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2}{c}$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*a*e^2*x^3 + a*d*e*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x/c^2 - arcsin(c*x)/c^3))*b*d*e + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2 + a*d^2*x + (c*x*arcsin(c*
x) + sqrt(-c^2*x^2 + 1))*b*d^2/c
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.56

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx = \frac{1}{3}ae^2x^3 + bd^2x\arcsin(cx) + ad^2x$$
$$+ \frac{(c^2x^2-1)be^2x\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdex}{2c}$$
$$+ \frac{(c^2x^2-1)bde\arcsin(cx)}{c^2} + \frac{be^2x\arcsin(cx)}{3c^2}$$
$$+ \frac{\sqrt{-c^2x^2+1}bd^2}{c} + \frac{(c^2x^2-1)ade}{c^2} + \frac{bde\arcsin(cx)}{2c^2}$$
$$- \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2}{9c^3} + \frac{\sqrt{-c^2x^2+1}be^2}{3c^3}$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/3*a*e^2*x^3 + b*d^2*x*arcsin(c*x) + a*d^2*x + 1/3*(c^2*x^2 - 1)*b*e^2*x*a
rcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*x/c + (c^2*x^2 - 1)*b*d*e*arc
sin(c*x)/c^2 + 1/3*b*e^2*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d^2/c + (
c^2*x^2 - 1)*a*d*e/c^2 + 1/2*b*d*e*arcsin(c*x)/c^2 - 1/9*(-c^2*x^2 + 1)^(3/
2)*b*e^2/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e^2/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(a+b\arcsin(cx))\,dx$$

$$= \begin{cases} b\,e^2\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)+\frac{a\,x\,\left(3\,d^2+3\,d\,e\,x+e^2\,x^2\right)}{3}+\frac{b\,d^2\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c}+\frac{2\,b\,d\,e\,\left(\frac{\mathrm{asin}(c\,x)\,\left(2\,c^2\,x^2-1\right)}{4} \cdots\right.}{c^2} \\ \int \left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^2\,dx \end{cases}$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^2,x)
```

```
[Out] piecewise(0 < c, b*e^2*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c
*x))/3) + (a*x*(3*d^2 + e^2*x^2 + 3*d*e*x))/3 + (b*d^2*((- c^2*x^2 + 1)^(1/
2) + c*x*asin(c*x)))/c + (2*b*d*e*((asin(c*x)*(2*c^2*x^2 - 1))/4 + (c*x*(-
c^2*x^2 + 1)^(1/2))/4))/c^2, ~0 < c, int((a + b*asin(c*x))*(d + e*x)^2, x))
```

3.3 $\int (d+ex)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 98

$$\int (d+ex)(a+b\arcsin(cx))\,dx = \frac{3bd\sqrt{1-c^2x^2}}{4c} + \frac{b(d+ex)\sqrt{1-c^2x^2}}{4c} - \frac{b\left(2d^2+\frac{e^2}{c^2}\right)\arcsin(cx)}{4e} + \frac{(d+ex)^2(a+b\arcsin(cx))}{2e}$$

```
[Out] -1/4*b*(2*d^2+e^2/c^2)*arcsin(c*x)/e+1/2*(e*x+d)^2*(a+b*arcsin(c*x))/e+3/4*
b*d*(-c^2*x^2+1)^(1/2)/c+1/4*b*(e*x+d)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4827, 757, 655, 222}

$$\int (d+ex)(a+b\arcsin(cx))\,dx = \frac{(d+ex)^2(a+b\arcsin(cx))}{2e} - \frac{b\arcsin(cx)\left(\frac{e^2}{c^2}+2d^2\right)}{4e} + \frac{b\sqrt{1-c^2x^2}(d+ex)}{4c} + \frac{3bd\sqrt{1-c^2x^2}}{4c}$$

```
[In] Int[(d + e*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*Sqrt[1 - c^2*x^2])/(4*c) + (b*(d + e*x)*Sqrt[1 - c^2*x^2])/(4*c) - (
b*(2*d^2 + e^2/c^2)*ArcSin[c*x])/(4*e) + ((d + e*x)^2*(a + b*ArcSin[c*x]))/
(2*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(d+ex)^2(a+b\arcsin(cx))}{2e} - \frac{(bc)\int \frac{(d+ex)^2}{\sqrt{1-c^2x^2}}\,dx}{2e} \\
&= \frac{b(d+ex)\sqrt{1-c^2x^2}}{4c} + \frac{(d+ex)^2(a+b\arcsin(cx))}{2e} + \frac{b\int \frac{-2c^2d^2-e^2-3c^2dex}{\sqrt{1-c^2x^2}}\,dx}{4ce} \\
&= \frac{3bd\sqrt{1-c^2x^2}}{4c} + \frac{b(d+ex)\sqrt{1-c^2x^2}}{4c} \\
&\quad + \frac{(d+ex)^2(a+b\arcsin(cx))}{2e} - \frac{(b(2c^2d^2+e^2))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4ce} \\
&= \frac{3bd\sqrt{1-c^2x^2}}{4c} + \frac{b(d+ex)\sqrt{1-c^2x^2}}{4c} - \frac{b\left(2d^2+\frac{e^2}{c^2}\right)\arcsin(cx)}{4e} + \frac{(d+ex)^2(a+b\arcsin(cx))}{2e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.94

$$\int (d+ex)(a+b\arcsin(cx))\,dx = adx+\frac{1}{2}aex^2+\frac{bd\sqrt{1-c^2x^2}}{c}+\frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2}+bdx\arcsin(cx)+\frac{1}{2}bex^2\arcsin(cx)$$

[In] Integrate[(d + e*x)*(a + b*ArcSin[c*x]),x]

[Out] a*d*x + (a*e*x^2)/2 + (b*d*Sqrt[1 - c^2*x^2])/c + (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) + b*d*x*ArcSin[c*x] + (b*e*x^2*ArcSin[c*x])/2

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.88

method	result	size
parts	$a\left(\frac{1}{2}e\,x^2+dx\right)+\frac{b\left(\frac{c\arcsin(cx)x^2e}{2}+\arcsin(cx)dcx-\frac{e\left(-\frac{cx\sqrt{-c^2x^2+1}}{2}+\frac{\arcsin(cx)}{2}\right)-2dc\sqrt{-c^2x^2+1}}{2c}\right)}{c}$	86
derivativedivides	$\frac{\frac{a\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b\left(\arcsin(cx)c^2xd+\frac{\arcsin(cx)c^2e\,x^2}{2}-\frac{e\left(-\frac{cx\sqrt{-c^2x^2+1}}{2}+\frac{\arcsin(cx)}{2}\right)}{2}+dc\sqrt{-c^2x^2+1}\right)}{c}}{c}$	97
default	$\frac{\frac{a\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b\left(\arcsin(cx)c^2xd+\frac{\arcsin(cx)c^2e\,x^2}{2}-\frac{e\left(-\frac{cx\sqrt{-c^2x^2+1}}{2}+\frac{\arcsin(cx)}{2}\right)}{2}+dc\sqrt{-c^2x^2+1}\right)}{c}}{c}$	97

[In] int((e*x+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/2*e*x^2+d*x)+b/c*(1/2*c*arcsin(c*x)*x^2*e+arcsin(c*x)*d*c*x-1/2/c*(e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-2*d*c*(-c^2*x^2+1)^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.78

$$\int (d+ex)(a+b\arcsin(cx))\,dx = \frac{2\,ac^2ex^2+4\,ac^2dx+(2\,bc^2ex^2+4\,bc^2dx-be)\arcsin{(cx)}+(bcex+4\,bcd)\sqrt{-c^2x^2+1}}{4\,c^2}$$

```
[In] integrate((e*x+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] 1/4*(2*a*c^2*e*x^2 + 4*a*c^2*d*x + (2*b*c^2*e*x^2 + 4*b*c^2*d*x - b*e)*arcs
in(c*x) + (b*c*e*x + 4*b*c*d)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.01

$$\int (d+ex)(a+b\arcsin(cx))\,dx = \begin{cases} adx+\frac{aex^2}{2}+bdx\operatorname{asin}{(cx)}+\frac{bex^2\operatorname{asin}{(cx)}}{2}+\frac{bd\sqrt{-c^2x^2+1}}{c}+\frac{bex\sqrt{-c^2x^2+1}}{4c}-\frac{be\operatorname{asin}{(cx)}}{4c^2} & \text{for}\ c\neq 0\\ a\left(dx+\frac{ex^2}{2}\right) & \text{otherwise}\end{cases}$$

```
[In] integrate((e*x+d)*(a+b*asin(c*x)),x)
[Out] Piecewise((a*d*x + a*e*x**2/2 + b*d*x*asin(c*x) + b*e*x**2*asin(c*x)/2 + b*
d*sqrt(-c**2*x**2 + 1)/c + b*e*x*sqrt(-c**2*x**2 + 1)/(4*c) - b*e*asin(c*x)
/(4*c**2), Ne(c, 0)), (a*(d*x + e*x**2/2), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.83

$$\begin{aligned}\int (d+ex)(a+b\arcsin(cx))\,dx &= \frac{1}{2}\,aex^2+\frac{1}{4}\left(2\,x^2\arcsin{(cx)}+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin{(cx)}}{c^3}\right)\right)be\\ &\quad+adx+\frac{\left(cx\arcsin{(cx)}+\sqrt{-c^2x^2+1}\right)bd}{c}\end{aligned}$$

```
[In] integrate((e*x+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] 1/2*a*e*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin
(c*x)/c^3))*b*e + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d/c
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00

$$\int (d+ex)(a+b\arcsin(cx))\,dx = bdx\arcsin(cx) + adx + \frac{\sqrt{-c^2x^2+1}bex}{4c} + \frac{(c^2x^2-1)be\arcsin(cx)}{2c^2} + \frac{\sqrt{-c^2x^2+1}bd}{c} + \frac{(c^2x^2-1)ae}{2c^2} + \frac{be\arcsin(cx)}{4c^2}$$

```
[In] integrate((e*x+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] b*d*x*arcsin(c*x) + a*d*x + 1/4*sqrt(-c^2*x^2 + 1)*b*e*x/c + 1/2*(c^2*x^2 -
 1)*b*e*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d/c + 1/2*(c^2*x^2 - 1)*a*e/
c^2 + 1/4*b*e*arcsin(c*x)/c^2
```

Mupad [B] (verification not implemented)

Time = 0.42 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.79

$$\int (d+ex)(a+b\arcsin(cx))\,dx = \frac{a\,x\,(2\,d+e\,x)}{2} + \frac{b\,e\left(\frac{\mathrm{asin}(c\,x)\,(2\,c^2\,x^2-1)}{4} + \frac{c\,x\,\sqrt{1-c^2\,x^2}}{4}\right)}{c^2} + \frac{b\,d\,\left(\sqrt{1-c^2\,x^2} + c\,x\,\mathrm{asin}(c\,x)\right)}{c}$$

```
[In] int((a + b*asin(c*x))*(d + e*x),x)
```

```
[Out] (a*x*(2*d + e*x))/2 + (b*e*((asin(c*x)*(2*c^2*x^2 - 1))/4 + (c*x*(1 - c^2*x
^2)^(1/2))/4))/c^2 + (b*d*((1 - c^2*x^2)^(1/2) + c*x*asin(c*x)))/c
```

3.4 $\int (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 8, antiderivative size = 30

$$\int (a+b\arcsin(cx))\,dx = ax+\frac{b\sqrt{1-c^2x^2}}{c}+bx\arcsin(cx)$$

```
[Out] a*x+b*x*arcsin(c*x)+b*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4715, 267}

$$\int (a+b\arcsin(cx))\,dx = ax+bx\arcsin(cx)+\frac{b\sqrt{1-c^2x^2}}{c}$$

```
[In] Int[a + b*ArcSin[c*x],x]
```

```
[Out] a*x + (b*Sqrt[1 - c^2*x^2])/c + b*x*ArcSin[c*x]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned} \text{integral} &= ax + b\int \arcsin(cx)\,dx \\ &= ax + bx\arcsin(cx) - (bc)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx \\ &= ax + \frac{b\sqrt{1-c^2x^2}}{c} + bx\arcsin(cx) \end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

$$\int (a + b\arcsin(cx))\,dx = ax + \frac{b\sqrt{1-c^2x^2}}{c} + bx\arcsin(cx)$$

```
[In] Integrate[a + b*ArcSin[c*x],x]
[Out] a*x + (b*Sqrt[1 - c^2*x^2])/c + b*x*ArcSin[c*x]
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

method	result	size
default	$ax + \frac{b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	30
parts	$ax + \frac{b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	30
derivativedivides	$\frac{cxa+b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	32

```
[In] int(a+b*arcsin(c*x),x,method=_RETURNVERBOSE)
[Out] a*x+b/c*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.03

$$\int (a + b \arcsin(cx)) \, dx = \frac{bcx \arcsin{(cx)} + acx + \sqrt{-c^2x^2 + 1}b}{c}$$

```
[In] integrate(a+b*arcsin(c*x),x, algorithm="fricas")
[Out] (b*c*x*arcsin(c*x) + a*c*x + sqrt(-c^2*x^2 + 1)*b)/c
```

Sympy [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.87

$$\int (a + b \arcsin(cx)) \, dx = ax + b \left(\begin{cases} x \operatorname{asin}{(cx)} + \frac{\sqrt{-c^2x^2+1}}{c} & \text{for } c \neq 0 \\ 0 & \text{otherwise} \end{cases} \right)$$

```
[In] integrate(a+b*asin(c*x),x)
[Out] a*x + b*Piecewise((x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, Ne(c, 0)), (0, Tru
e))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.97

$$\int (a + b \arcsin(cx)) \, dx = ax + \frac{\left(cx \arcsin{(cx)} + \sqrt{-c^2x^2 + 1}\right)b}{c}$$

```
[In] integrate(a+b*arcsin(c*x),x, algorithm="maxima")
[Out] a*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b/c
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.97

$$\int (a + b \arcsin(cx))\, dx = ax + \frac{\left(cx \arcsin(cx) + \sqrt{-c^2x^2 + 1}\right)b}{c}$$

```
[In] integrate(a+b*arcsin(c*x),x, algorithm="giac")
[Out] a*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b/c
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

$$\int (a + b \arcsin(cx))\, dx = a\,x + \frac{b\,\sqrt{1 - c^2\,x^2}}{c} + b\,x\,\mathrm{asin}(c\,x)$$

```
[In] int(a + b*asin(c*x),x)
[Out] a*x + (b*(1 - c^2*x^2)^(1/2))/c + b*x*asin(c*x)
```

3.5 $\int \frac{a+b\arcsin(cx)}{d+ex}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 229

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx = -\frac{i(a+b\arcsin(cx))^2}{2be}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

```
[Out] -1/2*I*(a+b*arcsin(c*x))^2/b/e+(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-c^2*x^2+
1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e+(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-
c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e-I*b*polylog(2,I*e*(I*c*x+(-c
^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e-I*b*polylog(2,I*e*(I*c*x+(-c^
2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4825, 4615, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx = \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^2}{2be}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x),x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c*x])^2)/(b*e) + ((a + b*ArcSin[c*x])*Log[1 - (I*e*
E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + ((a + b*ArcSin[c*x])*L
og[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*b*PolyL
og[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e - (I*b*PolyLo
g[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \text{Subst}\left(\int \frac{(a+bx)\cos(x)}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \text{Subst}\left(\int \frac{e^{ix}(a+bx)}{cd-\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right) + \text{Subst}\left(\int \frac{e^{ix}(a+bx)}{cd+\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{b\text{Subst}\left(\int \log\left(1-\frac{iee^{ix}}{cd-\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e} - \frac{b\text{Subst}\left(\int \log\left(1-\frac{iee^{ix}}{cd+\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{iex}{cd-\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{iex}{cd+\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{ib\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{ib\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx =$$
$$-\frac{i\left((a+b\arcsin(cx))\left(a+b\arcsin(cx)+2ib\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)+2ib\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)+2b^2\,\mathrm{P}\right.}{2be}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x),x]
```

```
[Out] ((-1/2*I)*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (2*I)*b*Log[1 + (I*e*E^
(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + (2*I)*b*Log[1 - (I*e*E^(
I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) + 2*b^2*PolyLog[2, ((-I)*e*E^
(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 2*b^2*PolyLog[2, (I*e*E^
(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/(b*e)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 757 vs. 2(244) = 488.

Time = 1.00 (sec) , antiderivative size = 758, normalized size of antiderivative = 3.31

method	result
parts	$\frac{a\ln(ex+d)}{e}+\frac{b\left(-\frac{i\arcsin(cx)^2c}{2e}+\frac{c^3\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)d^2}{e\left(c^2d^2-e^2\right)}-\frac{ec\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-\right.}}{idc}\right.}{c^2d^2-}\right.}{}$
derivativedivides	$\frac{\frac{ac\ln(cex+dc)}{e}+bc\left(-\frac{i\arcsin(cx)^2}{2e}+\frac{ie\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}+\frac{ie\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2}}{idc+\sqrt{-c^2d^2+e^2}}\right.}{c^2d^2-e^2}\right.}{}$
default	$\frac{\frac{ac\ln(cex+dc)}{e}+bc\left(-\frac{i\arcsin(cx)^2}{2e}+\frac{ie\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}+\frac{ie\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2}}{idc+\sqrt{-c^2d^2+e^2}}\right.}{c^2d^2-e^2}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

```
[Out] a*ln(e*x+d)/e+b/c*(-1/2*I*arcsin(c*x)^2*c/e+1/e*c^3*arcsin(c*x)/(c^2*d^2-e^
2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^
2*d^2+e^2)^(1/2)))*d^2-e*c*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2
*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-e*c*ar
csin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^
```

```
2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/e*c^3*arcsin(c*x)/(c^2*d^2-e^2)*l
n((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^
2+e^2)^(1/2)))*d^2-I/e*c^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-I/e*c^3/(c^
2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/
(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+I*e*c/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(
-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+I*
e*c/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^
(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{ex+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e*x + d), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx=\int \frac{a+b\operatorname{asin}\left(cx\right)}{d+ex}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x+d),x)
[Out] Integral((a + b*asin(c*x))/(d + e*x), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{ex+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
[Out] b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x) + a*lo
g(e*x + d)/e
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx = \int \frac{b\arcsin(cx)+a}{ex+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx = \int \frac{a+b\operatorname{asin}(c\,x)}{d+e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x),x)
[Out] int((a + b*asin(c*x))/(d + e*x), x)
```

3.6 $\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 85

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx = -\frac{a+b\arcsin(cx)}{e(d+ex)} + \frac{bc\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e\sqrt{c^2d^2-e^2}}$$

```
[Out] (-a-b*arcsin(c*x))/e/(e*x+d)+b*c*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c
^2*x^2+1)^(1/2))/e/(c^2*d^2-e^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4827, 739, 210}

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx = \frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} - \frac{a+b\arcsin(cx)}{e(d+ex)}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c*x])/(e*(d + e*x))) + (b*c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*
d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e*Sqrt[c^2*d^2 - e^2])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{e(d+ex)}+\frac{(bc)\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e}\\
&= -\frac{a+b\arcsin(cx)}{e(d+ex)}-\frac{(bc)\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e}\\
&= -\frac{a+b\arcsin(cx)}{e(d+ex)}+\frac{bc\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e\sqrt{c^2d^2-e^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.98

$$\int\frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx=\frac{-\frac{a+b\arcsin(cx)}{d+ex}+\frac{bc\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x)^2,x]
[Out] (-((a + b*ArcSin[c*x])/(d + e*x)) + (b*c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2
 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 186 vs. 2(81) = 162.

Time = 1.01 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.20

method	result
parts	$-\frac{a}{(ex+d)e}-\frac{bc\arcsin(cx)}{(cex+dc)e}-\frac{bc\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+2\sqrt{-\frac{c^2d^2-e^2}{e^2}}\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{cx+\frac{dc}{e}}\right.}{e^2\sqrt{-\frac{c^2d^2-e^2}{e^2}}}$
derivativedivides	$\frac{-\frac{ac^2}{(cex+dc)e}+bc^2\left(-\frac{\arcsin(cx)}{(cex+dc)e}-\frac{\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+2\sqrt{-\frac{c^2d^2-e^2}{e^2}}\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{cx+\frac{dc}{e}}\right)}{e^2\sqrt{-\frac{c^2d^2-e^2}{e^2}}}\right.}{c}$
default	$\frac{-\frac{ac^2}{(cex+dc)e}+bc^2\left(-\frac{\arcsin(cx)}{(cex+dc)e}-\frac{\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+2\sqrt{-\frac{c^2d^2-e^2}{e^2}}\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{cx+\frac{dc}{e}}\right)}{e^2\sqrt{-\frac{c^2d^2-e^2}{e^2}}}\right.}{c}$

```
[In] int((a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/(e*x+d)/e-b*c/(c*e*x+c*d)/e*arcsin(c*x)-b*c/e^2/(-(c^2*d^2-e^2)/e^2)^(1/
2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2
)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)
)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. 2(79) = 158.

Time = 0.28 (sec) , antiderivative size = 371, normalized size of antiderivative = 4.36

$$\int\frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx$$
$$=\left[-\frac{2\,ac^2d^2-2\,ae^2+\sqrt{-c^2d^2+e^2}(bcex+bcd)\log\left(\frac{2\,c^2dex-c^2d^2+(2\,c^4d^2-c^2e^2)x^2-2\,\sqrt{-c^2d^2+e^2}\,(c^2dx+e)\sqrt{-c^2x^2+1}+2}{e^2x^2+2\,dex+d^2}\right.}{2\,(c^2d^3e-de^3+(c^2d^2e^2-e^4)x)}\right.$$
$$\left.-\frac{ac^2d^2-ae^2-\sqrt{c^2d^2-e^2}(bcex+bcd)\arctan\left(\frac{\sqrt{c^2d^2-e^2}\,(c^2dx+e)\sqrt{-c^2x^2+1}}{c^2d^2-(c^4d^2-c^2e^2)x^2-e^2}\right)+(bc^2d^2-be^2)\arcsin(cx)}{c^2d^3e-de^3+(c^2d^2e^2-e^4)x}\right]$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] [-1/2*(2*a*c^2*d^2 - 2*a*e^2 + sqrt(-c^2*d^2 + e^2)*(b*c*e*x + b*c*d)*log((
2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*
(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 2*(b
*c^2*d^2 - b*e^2)*arcsin(c*x))/(c^2*d^3*e - d*e^3 + (c^2*d^2*e^2 - e^4)*x),
 -(a*c^2*d^2 - a*e^2 - sqrt(c^2*d^2 - e^2)*(b*c*e*x + b*c*d)*arctan(sqrt(c^
2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2
)*x^2 - e^2)) + (b*c^2*d^2 - b*e^2)*arcsin(c*x))/(c^2*d^3*e - d*e^3 + (c^2*
d^2*e^2 - e^4)*x)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^2} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{(d + ex)^2} \, dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^2} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 200 vs. $2(79) = 158$.

Time = 0.31 (sec) , antiderivative size = 200, normalized size of antiderivative = 2.35

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx$$
$$= -\frac{be^2\left(\frac{2\,c^2\arctan\left(\frac{\frac{cde\left(\sqrt{-\frac{(ex+d)^2\left(c-\frac{cd}{ex+d}\right)^2}{e^2}+1}-1\right)}{(ex+d)\left(c-\frac{cd}{ex+d}\right)}-e}{\sqrt{c^2d^2-e^2}}\right)}{\sqrt{c^2d^2-e^2}e^3}+\frac{c^2\arcsin\left(-\frac{c\left(d-\frac{\frac{(ex+d)\left(c-\frac{cd}{ex+d}\right)e}{c}+de}{e}\right)}{e}\right)}{\left((ex+d)\left(c-\frac{cd}{ex+d}\right)+cd\right)e^3}\right)}{c} - \frac{a}{(ex+d)e}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] -b*e^2*(2*c^2*arctan((c*d*e*(sqrt(-(e*x + d)^2*(c - c*d/(e*x + d))^2/e^2 +
1) - 1)/((e*x + d)*(c - c*d/(e*x + d))) - e)/sqrt(c^2*d^2 - e^2))/(sqrt(c^2
*d^2 - e^2)*e^3) + c^2*arcsin(-c*(d - ((e*x + d)*(c - c*d/(e*x + d))*e/c +
d*e)/e)/e)/(((e*x + d)*(c - c*d/(e*x + d)) + c*d)*e^3))/c - a/((e*x + d)*e)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\left(d+e\,x\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x)^2,x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x)^2, x)
```

3.7 $\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 135

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx = \frac{bc\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)(d+ex)} - \frac{a+b\arcsin(cx)}{2e(d+ex)^2} + \frac{bc^3d\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e\left(c^2d^2-e^2\right)^{3/2}}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/e/(e*x+d)^2+1/2*b*c^3*d*arctan((c^2*d*x+e)/(c^2*d^2-
e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e/(c^2*d^2-e^2)^(3/2)+1/2*b*c*(-c^2*x^2+1)^(
1/2)/(c^2*d^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4827, 745, 739, 210}

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx = -\frac{a+b\arcsin(cx)}{2e(d+ex)^2} + \frac{bc^3d\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{2e\left(c^2d^2-e^2\right)^{3/2}} + \frac{bc\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)(d+ex)}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)) - (a + b*ArcSin[c*x])
/(2*e*(d + e*x)^2) + (b*c^3*d*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqr
t[1 - c^2*x^2])])/(2*e*(c^2*d^2 - e^2)^(3/2))
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{2e(d+ex)^2}+\frac{(bc)\int \frac{1}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e}\\
&= \frac{bc\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)(d+ex)}-\frac{a+b\arcsin(cx)}{2e(d+ex)^2}+\frac{\left(bc^3d\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e\left(c^2d^2-e^2\right)}\\
&= \frac{bc\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)(d+ex)}-\frac{a+b\arcsin(cx)}{2e(d+ex)^2}-\frac{\left(bc^3d\right)\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e\left(c^2d^2-e^2\right)}\\
&= \frac{bc\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)(d+ex)}-\frac{a+b\arcsin(cx)}{2e(d+ex)^2}+\frac{bc^3d\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e\left(c^2d^2-e^2\right)^{3/2}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.53

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx = \frac{1}{2}\left(-\frac{a}{e(d+ex)^2}+\frac{bc\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{b\arcsin(cx)}{e(d+ex)^2}-\frac{ibc^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{bc^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x)^3,x]
```

```
[Out] (-(a/(e*(d + e*x)^2)) + (b*c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x))
 - (b*ArcSin[c*x])/(e*(d + e*x)^2) - (I*b*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2
*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(b*c
^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2]))/2
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 294 vs. 2(124) = 248.

Time = 0.33 (sec) , antiderivative size = 295, normalized size of antiderivative = 2.19

method	result
parts	$-\frac{a}{2(ex+d)^2 e}-\frac{b\,c^2\arcsin(cx)}{2(cex+dc)^2 e}+\frac{b\,c^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{2e(c^2d^2-e^2)\left(cx+\frac{dc}{e}\right)}-\frac{b\,c^3 d\ln\left(-\frac{2\left(c^2d^2-e^2\right)}{e^2}+\frac{2dc\left(cx+\frac{d}{e}\right.}{e}\right.}{2e}$
derivativedivides	$\frac{-\frac{a\,c^3}{2(cex+dc)^2 e}+b\,c^3\left(-\frac{\arcsin(cx)}{2(cex+dc)^2 e}+\frac{\frac{e^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)}-\frac{dce\ln\left(-\frac{2\left(c^2d^2-e^2\right)}{e^2}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+2\sqrt{-}\right.}{\left(c^2d^2-\right.}}{2e^3}\right.}{c}$
default	$\frac{-\frac{a\,c^3}{2(cex+dc)^2 e}+b\,c^3\left(-\frac{\arcsin(cx)}{2(cex+dc)^2 e}+\frac{\frac{e^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)}-\frac{dce\ln\left(-\frac{2\left(c^2d^2-e^2\right)}{e^2}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+2\sqrt{-}\right.}{\left(c^2d^2-\right.}}{2e^3}\right.}{c}$

```
[In] int((a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
[Out] -1/2*a/(e*x+d)^2/e-1/2*b*c^2/(c*e*x+c*d)^2/e*arcsin(c*x)+1/2*b*c^2/e/(c^2*d
^2-e^2)/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^
(1/2)-1/2*b*c^3/e^2*d/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*
d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)
^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 322 vs. $2(121) = 242$.

Time = 0.35 (sec) , antiderivative size = 673, normalized size of antiderivative = 4.99

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx$$
$$=\left[-\frac{2\,ac^4d^4-4\,ac^2d^2e^2+2\,ae^4-(bc^3de^2x^2+2\,bc^3d^2ex+bc^3d^3)\sqrt{-c^2d^2+e^2}\log\left(\frac{2\,c^2dex-c^2d^2+(2\,c^4d^2-c^2e^2)x}{e^2}\right.}{4\,(c^4d^6e-2\,c^2d^4e^3+d^2e^5+(c\right.}$$
$$-\frac{ac^4d^4-2\,ac^2d^2e^2+ae^4-(bc^3de^2x^2+2\,bc^3d^2ex+bc^3d^3)\sqrt{c^2d^2-e^2}\arctan\left(\frac{\sqrt{c^2d^2-e^2}(c^2dx+e)\sqrt{-c^2x^2+1}}{c^2d^2-(c^4d^2-c^2e^2)x^2-e^2}\right)}{2\,(c^4d^6e-2\,c^2d^4e^3+d^2e^5+(c^4d^4e^3-2\,c^2d^2e^5+}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(2*a*c^4*d^4 - 4*a*c^2*d^2*e^2 + 2*a*e^4 - (b*c^3*d*e^2*x^2 + 2*b*c^3
*d^2*e*x + b*c^3*d^3)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*
c^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2
 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 2*(b*c^4*d^4 - 2*b*c^2*d^2*e^2
+ b*e^4)*arcsin(c*x) - 2*(b*c^3*d^3*e - b*c*d*e^3 + (b*c^3*d^2*e^2 - b*c*e^
4)*x)*sqrt(-c^2*x^2 + 1))/(c^4*d^6*e - 2*c^2*d^4*e^3 + d^2*e^5 + (c^4*d^4*e
^3 - 2*c^2*d^2*e^5 + e^7)*x^2 + 2*(c^4*d^5*e^2 - 2*c^2*d^3*e^4 + d*e^6)*x),
 -1/2*(a*c^4*d^4 - 2*a*c^2*d^2*e^2 + a*e^4 - (b*c^3*d*e^2*x^2 + 2*b*c^3*d^2
*e*x + b*c^3*d^3)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x +
 e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + (b*c^4*
d^4 - 2*b*c^2*d^2*e^2 + b*e^4)*arcsin(c*x) - (b*c^3*d^3*e - b*c*d*e^3 + (b*
c^3*d^2*e^2 - b*c*e^4)*x)*sqrt(-c^2*x^2 + 1))/(c^4*d^6*e - 2*c^2*d^4*e^3 +
d^2*e^5 + (c^4*d^4*e^3 - 2*c^2*d^2*e^5 + e^7)*x^2 + 2*(c^4*d^5*e^2 - 2*c^2*
d^3*e^4 + d*e^6)*x)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{(d + ex)^3} \, dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \int \frac{b \arcsin(cx) + a}{(ex + d)^3} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \int \frac{a + b \operatorname{asin}(c x)}{(d + e x)^3} \, dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x)^3,x)
[Out] int((a + b*asin(c*x))/(d + e*x)^3, x)
```

3.8 $\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 191

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx=\frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc^3d\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}-\frac{a+b\arcsin(cx)}{3e(d+ex)^3}+\frac{bc^3\left(2c^2d^2+e^2\right)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e\left(c^2d^2-e^2\right)^{5/2}}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/e/(e*x+d)^3+1/6*b*c^3*(2*c^2*d^2+e^2)*arctan((c^2*d*
x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e/(c^2*d^2-e^2)^(5/2)+1/6*b*c*
(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)/(e*x+d)^2+1/2*b*c^3*d*(-c^2*x^2+1)^(1/2)/(
c^2*d^2-e^2)^2/(e*x+d)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4827, 759, 821, 739, 210}

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx=-\frac{a+b\arcsin(cx)}{3e(d+ex)^3}+\frac{bc^3\left(2c^2d^2+e^2\right)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{6e\left(c^2d^2-e^2\right)^{5/2}}+\frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc^3d\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x)^4,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(6*(c^2*d^2 - e^2)*(d + e*x)^2) + (b*c^3*d*Sqrt[1 -
 c^2*x^2])/(2*(c^2*d^2 - e^2)^2*(d + e*x)) - (a + b*ArcSin[c*x])/(3*e*(d +
```

```
e*x)^3) + (b*c^3*(2*c^2*d^2 + e^2)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2
]*Sqrt[1 - c^2*x^2])])/(6*e*(c^2*d^2 - e^2)^(5/2))
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 759

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{3e(d+ex)^3}+\frac{(bc)\int\frac{1}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{3e}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2} - \frac{a+b\arcsin(cx)}{3e(d+ex)^3} - \frac{(bc^3)\int\frac{-2d+ex}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{6e\left(c^2d^2-e^2\right)}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2} + \frac{bc^3d\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)} - \frac{a+b\arcsin(cx)}{3e(d+ex)^3} + \frac{\left(bc^3(2c^2d^2+e^2)\right)\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{6e\left(c^2d^2-e^2\right)^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2} + \frac{bc^3d\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)} - \frac{a+b\arcsin(cx)}{3e(d+ex)^3} - \frac{\left(bc^3(2c^2d^2+e^2)\right)\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{6e\left(c^2d^2-e^2\right)^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{6\left(c^2d^2-e^2\right)(d+ex)^2} + \frac{bc^3d\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)} - \frac{a+b\arcsin(cx)}{3e(d+ex)^3} + \frac{bc^3(2c^2d^2+e^2)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e\left(c^2d^2-e^2\right)^{5/2}}$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.26

$$\int\frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \frac{1}{6}\left(-\frac{2a}{e(d+ex)^3} + \frac{b\sqrt{1-c^2x^2}(-ce^2+c^3d(4d+3ex))}{\left(-c^2d^2+e^2\right)^2(d+ex)^2} - \frac{2b\arcsin(cx)}{e(d+ex)^3} + \frac{bc^3(2c^2d^2+e^2)\log(d+ex)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}} - \frac{bc^3(2c^2d^2+e^2)\log\left(e+c^2dx+\sqrt{-c^2d^2+e^2}\sqrt{1-c^2x^2}\right)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x)^4,x]
```

```
[Out] ((-2*a)/(e*(d + e*x)^3) + (b*Sqrt[1 - c^2*x^2]*(-(c*e^2) + c^3*d*(4*d + 3*e
*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*b*ArcSin[c*x])/(e*(d + e*x)^3
) + (b*c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sq
rt[-(c^2*d^2) + e^2]) - (b*c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*x + Sqrt[-(c
^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2
*d^2) + e^2]))/6
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 553 vs. $2(176) = 352$.

Time = 0.21 (sec) , antiderivative size = 554, normalized size of antiderivative = 2.90

method	result
parts	$-\frac{a}{3(ex+d)^3 e}-\frac{b\,c^3\arcsin(cx)}{3(cex+dc)^3 e}+\frac{b\,c^3\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2(c^2d^2-e^2)\left(cx+\frac{dc}{e}\right)^2}+\frac{b\,c^4 d\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}}}{2e(c^2d^2-e^2)^2\left(cx+\frac{dc}{e}\right)}$
derivativedivides	$-\frac{a\,c^4}{3(cex+dc)^3 e}-\frac{b\,c^4\arcsin(cx)}{3(cex+dc)^3 e}+\frac{b\,c^4\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)^2}+\frac{b\,c^5 d\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{2e\left(c^2d^2-e^2\right)^2\left(cx+\frac{dc}{e}\right)}-$
default	$-\frac{a\,c^4}{3(cex+dc)^3 e}-\frac{b\,c^4\arcsin(cx)}{3(cex+dc)^3 e}+\frac{b\,c^4\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)^2}+\frac{b\,c^5 d\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{2e\left(c^2d^2-e^2\right)^2\left(cx+\frac{dc}{e}\right)}-$

```
[In] int((a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/(e*x+d)^3/e-1/3*b*c^3/(c*e*x+c*d)^3/e*arcsin(c*x)+1/6*b*c^3/e^2/(c^2
*d^2-e^2)/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e
^2)^(1/2)+1/2*b*c^4/e*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e
*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-1/2*b*c^5/e^2*d^2/(c^2*d^2-e^2)^2/(-(
c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c
^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^
2)^(1/2))/(c*x+d*c/e))+1/6*b*c^3/e^2/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/
2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2
)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)
)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. 2(173) = 346.

Time = 0.86 (sec) , antiderivative size = 1125, normalized size of antiderivative = 5.89

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx$$

$$= \left[-\frac{4\,ac^6d^6 - 12\,ac^4d^4e^2 + 12\,ac^2d^2e^4 - 4\,ae^6 + (2\,bc^5d^5 + bc^3d^3e^2 + (2\,bc^5d^2e^3 + bc^3e^5)x^3 + 3\,(2\,bc^5d^3e^2 + b}{} \right.$$

$$-\frac{2\,ac^6d^6 - 6\,ac^4d^4e^2 + 6\,ac^2d^2e^4 - 2\,ae^6 - (2\,bc^5d^5 + bc^3d^3e^2 + (2\,bc^5d^2e^3 + bc^3e^5)x^3 + 3\,(2\,bc^5d^3e^2 + bc^3}{6\,(c^6d^9e - 3\,c^4d^7}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] [-1/12*(4*a*c^6*d^6 - 12*a*c^4*d^4*e^2 + 12*a*c^2*d^2*e^4 - 4*a*e^6 + (2*b*
c^5*d^5 + b*c^3*d^3*e^2 + (2*b*c^5*d^2*e^3 + b*c^3*e^5)*x^3 + 3*(2*b*c^5*d^
3*e^2 + b*c^3*d*e^4)*x^2 + 3*(2*b*c^5*d^4*e + b*c^3*d^2*e^3)*x)*sqrt(-c^2*d
^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqrt(-
c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x
 + d^2)) + 4*(b*c^6*d^6 - 3*b*c^4*d^4*e^2 + 3*b*c^2*d^2*e^4 - b*e^6)*arcsin
(c*x) - 2*(4*b*c^5*d^5*e - 5*b*c^3*d^3*e^3 + b*c*d*e^5 + 3*(b*c^5*d^3*e^3 -
 b*c^3*d*e^5)*x^2 + (7*b*c^5*d^4*e^2 - 8*b*c^3*d^2*e^4 + b*c*e^6)*x)*sqrt(-
c^2*x^2 + 1))/(c^6*d^9*e - 3*c^4*d^7*e^3 + 3*c^2*d^5*e^5 - d^3*e^7 + (c^6*d
^6*e^4 - 3*c^4*d^4*e^6 + 3*c^2*d^2*e^8 - e^10)*x^3 + 3*(c^6*d^7*e^3 - 3*c^4
*d^5*e^5 + 3*c^2*d^3*e^7 - d*e^9)*x^2 + 3*(c^6*d^8*e^2 - 3*c^4*d^6*e^4 + 3*
c^2*d^4*e^6 - d^2*e^8)*x), -1/6*(2*a*c^6*d^6 - 6*a*c^4*d^4*e^2 + 6*a*c^2*d^
2*e^4 - 2*a*e^6 - (2*b*c^5*d^5 + b*c^3*d^3*e^2 + (2*b*c^5*d^2*e^3 + b*c^3*e
^5)*x^3 + 3*(2*b*c^5*d^3*e^2 + b*c^3*d*e^4)*x^2 + 3*(2*b*c^5*d^4*e + b*c^3*
d^2*e^3)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sq
rt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + 2*(b*c^6*d^6
- 3*b*c^4*d^4*e^2 + 3*b*c^2*d^2*e^4 - b*e^6)*arcsin(c*x) - (4*b*c^5*d^5*e -
 5*b*c^3*d^3*e^3 + b*c*d*e^5 + 3*(b*c^5*d^3*e^3 - b*c^3*d*e^5)*x^2 + (7*b*c
^5*d^4*e^2 - 8*b*c^3*d^2*e^4 + b*c*e^6)*x)*sqrt(-c^2*x^2 + 1))/(c^6*d^9*e -
 3*c^4*d^7*e^3 + 3*c^2*d^5*e^5 - d^3*e^7 + (c^6*d^6*e^4 - 3*c^4*d^4*e^6 + 3
*c^2*d^2*e^8 - e^10)*x^3 + 3*(c^6*d^7*e^3 - 3*c^4*d^5*e^5 + 3*c^2*d^3*e^7 -
 d*e^9)*x^2 + 3*(c^6*d^8*e^2 - 3*c^4*d^6*e^4 + 3*c^2*d^4*e^6 - d^2*e^8)*x)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{(d+ex)^4}\,dx$$

[In] integrate((a+b*asin(c*x))/(e*x+d)**4,x)

[Out] Integral((a + b*asin(c*x))/(d + e*x)**4, x)

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^4}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")

[Out] -1/3*(3*(c*e^4*x^3 + 3*c*d*e^3*x^2 + 3*c*d^2*e^2*x + c*d^3*e)*integrate(1/3*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^4*x^7 + 3*c^4*d*e^3*x^6 - 3*c^2*d^2*e^2*x^3 - c^2*d^3*e*x^2 + (3*c^4*d^2*e^2 - c^2*e^4)*x^5 + (c^4*d^3*e - 3*c^2*d*e^3)*x^4 + (c^2*e^4*x^5 + 3*c^2*d*e^3*x^4 - 3*d^2*e^2*x - d^3*e + (3*c^2*d^2*e^2 - e^4)*x^3 + (c^2*d^3*e - 3*d*e^3)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/3*a/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e)

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^4}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/(e*x + d)^4, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\left(d+e\,x\right)^4}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x)^4,x)
[Out] int((a + b*asin(c*x))/(d + e*x)^4, x)
```

3.9 $\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 374

$$\begin{aligned}\int (d+ex)^3(a+b\arcsin(cx))^2\,dx &= -2b^2d^3x-\frac{4b^2de^2x}{3c^2}-\frac{3}{4}b^2d^2ex^2-\frac{3b^2e^3x^2}{32c^2}-\frac{2}{9}b^2de^2x^3\\ &\quad-\frac{1}{32}b^2e^3x^4+\frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\ &\quad+\frac{4bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3}\\ &\quad+\frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\ &\quad+\frac{3be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}\\ &\quad+\frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}\\ &\quad+\frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\ &\quad-\frac{d^4(a+b\arcsin(cx))^2}{4e}-\frac{3d^2e(a+b\arcsin(cx))^2}{4c^2}\\ &\quad-\frac{3e^3(a+b\arcsin(cx))^2}{32c^4}+\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}\end{aligned}$$

```
[Out] -2*b^2*d^3*x-4/3*b^2*d*e^2*x/c^2-3/4*b^2*d^2*e*x^2-3/32*b^2*e^3*x^2/c^2-2/9
*b^2*d*e^2*x^3-1/32*b^2*e^3*x^4-1/4*d^4*(a+b*arcsin(c*x))^2/e-3/4*d^2*e*(a+
b*arcsin(c*x))^2/c^2-3/32*e^3*(a+b*arcsin(c*x))^2/c^4+1/4*(e*x+d)^4*(a+b*ar
csin(c*x))^2/e+2*b*d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/3*b*d*e^2*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+3/2*b*d^2*e*x*(a+b*arcsin(c*x))*(-c
^2*x^2+1)^(1/2)/c+3/16*b*e^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/3
*b*d*e^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+1/8*b*e^3*x^3*(a+b*arcs
in(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4827, 4847, 4737, 4767, 8, 4795, 30}

$$\begin{aligned}\int (d+ex)^3(a+b\arcsin(cx))^2\,dx = &-\frac{3e^3(a+b\arcsin(cx))^2}{32c^4}\\ &+\frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\ &+\frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\ &-\frac{3d^2e(a+b\arcsin(cx))^2}{4c^2}\\ &+\frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}\\ &+\frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\ &+\frac{4bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3}\\ &+\frac{3be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}\\ &-\frac{d^4(a+b\arcsin(cx))^2}{4e}+\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}\\ &-\frac{4b^2de^2x}{3c^2}-\frac{3b^2e^3x^2}{32c^2}-2b^2d^3x\\ &-\frac{3}{4}b^2d^2ex^2-\frac{2}{9}b^2de^2x^3-\frac{1}{32}b^2e^3x^4\end{aligned}$$

```
[In] Int[(d + e*x)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^3*x - (4*b^2*d*e^2*x)/(3*c^2) - (3*b^2*d^2*e*x^2)/4 - (3*b^2*e^3*x
^2)/(32*c^2) - (2*b^2*d*e^2*x^3)/9 - (b^2*e^3*x^4)/32 + (2*b*d^3*Sqrt[1 - c
^2*x^2]*(a + b*ArcSin[c*x]))/c + (4*b*d*e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(3*c^3) + (3*b*d^2*e*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c)
 + (3*b*e^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c^3) + (2*b*d*e^2*
x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c) + (b*e^3*x^3*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(8*c) - (d^4*(a + b*ArcSin[c*x])^2)/(4*e) - (3*d^
2*e*(a + b*ArcSin[c*x])^2)/(4*c^2) - (3*e^3*(a + b*ArcSin[c*x])^2)/(32*c^4)
 + ((d + e*x)^4*(a + b*ArcSin[c*x])^2)/(4*e)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e} - \frac{(bc)\int \frac{(d+ex)^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{2e} \\
&= \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e} \\
&\quad - \frac{(bc)\int \left(\frac{d^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{4d^3ex(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{6d^2e^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{4de^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{e^4x^4(a+b\,\mathrm{arc}}{\sqrt{1-c^2}}\right.}{2e} \\
&= \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e} - \left(2bcd^3\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \frac{\left(bcd^4\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2e} - \left(3bcd^2e\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \left(2bcde^2\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{2}\left(bce^3\right)\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad - \frac{d^4(a+b\arcsin(cx))^2}{4e} + \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e} - \left(2b^2d^3\right)\int 1\,dx \\
&\quad - \frac{1}{2}\left(3b^2d^2e\right)\int x\,dx - \frac{\left(3bd^2e\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c} - \frac{1}{3}\left(2b^2de^2\right)\int x^2\,dx \\
&\quad - \frac{\left(4bde^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3c} - \frac{1}{8}\left(b^2e^3\right)\int x^3\,dx - \frac{\left(3be^3\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c} \\
&= -2b^2d^3x - \frac{3}{4}b^2d^2ex^2 - \frac{2}{9}b^2de^2x^3 - \frac{1}{32}b^2e^3x^4 + \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{4bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} + \frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} + \frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} \\
&\quad + \frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} - \frac{d^4(a+b\arcsin(cx))^2}{4e} \\
&\quad - \frac{3d^2e(a+b\arcsin(cx))^2}{4c^2} + \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e} \\
&\quad - \frac{\left(4b^2de^2\right)\int 1\,dx}{3c^2} - \frac{\left(3be^3\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^3} - \frac{\left(3b^2e^3\right)\int x\,dx}{16c^2}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2d^3x - \frac{4b^2de^2x}{3c^2} - \frac{3}{4}b^2d^2ex^2 - \frac{3b^2e^3x^2}{32c^2} - \frac{2}{9}b^2de^2x^3 - \frac{1}{32}b^2e^3x^4 \\
&\quad + \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} \\
&\quad + \frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} + \frac{3be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&\quad + \frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad - \frac{d^4(a+b\arcsin(cx))^2}{4e} - \frac{3d^2e(a+b\arcsin(cx))^2}{4c^2} \\
&\quad - \frac{3e^3(a+b\arcsin(cx))^2}{32c^4} + \frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 355, normalized size of antiderivative = 0.95

$$
\int (d+ex)^3(a+b\arcsin(cx))^2\,dx
$$
$$
= \frac{c\big(72a^2c^3x(4d^3+6d^2ex+4de^2x^2+e^3x^3)+6ab\sqrt{1-c^2x^2}(e^2(64d+9ex)+c^2(96d^3+72d^2ex+32de^2x^2+
$$

```
[In] Integrate[(d + e*x)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (c*(72*a^2*c^3*x*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3) + 6*a*b*Sqrt[1
 - c^2*x^2]*(e^2*(64*d + 9*e*x) + c^2*(96*d^3 + 72*d^2*e*x + 32*d*e^2*x^2 +
 6*e^3*x^3)) - b^2*c*x*(3*e^2*(128*d + 9*e*x) + c^2*(576*d^3 + 216*d^2*e*x
+ 64*d*e^2*x^2 + 9*e^3*x^3))) + 6*b*(3*a*(-24*c^2*d^2*e - 3*e^3 + 8*c^4*x*(
4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3)) + b*c*Sqrt[1 - c^2*x^2]*(e^2*(6
4*d + 9*e*x) + c^2*(96*d^3 + 72*d^2*e*x + 32*d*e^2*x^2 + 6*e^3*x^3)))*ArcSi
n[c*x] + 9*b^2*(-24*c^2*d^2*e - 3*e^3 + 8*c^4*x*(4*d^3 + 6*d^2*e*x + 4*d*e^
2*x^2 + e^3*x^3))*ArcSin[c*x]^2)/(288*c^4)
```

Maple [A] (verified)

Time = 0.57 (sec) , antiderivative size = 541, normalized size of antiderivative = 1.45

method	result
derivativedivides	$\frac{\frac{a^2(cex+dc)^4}{4c^3e}+\frac{b^2\left(d^3c^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3d^2c^2e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin\right.}{4}}{}}{}$
default	$\frac{\frac{a^2(cex+dc)^4}{4c^3e}+\frac{b^2\left(d^3c^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3d^2c^2e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin\right.}{4}}{}}{}$
parts	$\frac{a^2(ex+d)^4}{4e}+\frac{b^2\left(288\arcsin(cx)^2c^4x^4e^3+1152\arcsin(cx)^2c^4x^3de^2+1728\arcsin(cx)^2c^4x^2d^2e+1152\arcsin(cx)^2c^4xd^3+\right.}{}$

```
[In] int((e*x+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(1/4*a^2/c^3*(c*e*x+c*d)^4/e+b^2/c^3*(d^3*c^3*(c*x*arcsin(c*x)^2-2*c*x+
2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+3/4*d^2*c^2*e*(2*arcsin(c*x)^2*x^2*c^2+2*
(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/9*d*c*e^2*(9*c^
3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/128*e^3*(32*arcsin(c*x)^2*x^4*c^4+1
6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*ar
csin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9))+2*a*b/c^3*(1/4/e*arcsin(c*x)*
c^4*d^4+arcsin(c*x)*c^4*d^3*x+3/2*e*arcsin(c*x)*c^4*d^2*x^2+e^2*arcsin(c*x)
*c^4*d*x^3+1/4*arcsin(c*x)*e^3*c^4*x^4-1/4/e*(c^4*d^4*arcsin(c*x)+e^4*(-1/4
*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-4*d
^3*c^3*e*(-c^2*x^2+1)^(1/2)+6*d^2*c^2*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*
arcsin(c*x))+4*d*c*e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1
/2)))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 446, normalized size of antiderivative = 1.19

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$
$$=\frac{9\,(8\,a^2-b^2)c^4e^3x^4+32\,(9\,a^2-2\,b^2)c^4de^2x^3+27\,(8\,(2\,a^2-b^2)c^4d^2e-b^2c^2e^3)x^2+9\,(8\,b^2c^4e^3x^4+32\,b^2c^4de}{}$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/288*(9*(8*a^2 - b^2)*c^4*e^3*x^4 + 32*(9*a^2 - 2*b^2)*c^4*d*e^2*x^3 + 27*
(8*(2*a^2 - b^2)*c^4*d^2*e - b^2*c^2*e^3)*x^2 + 9*(8*b^2*c^4*e^3*x^4 + 32*b
^2*c^4*d*e^2*x^3 + 48*b^2*c^4*d^2*e*x^2 + 32*b^2*c^4*d^3*x - 24*b^2*c^2*d^2
*e - 3*b^2*e^3)*arcsin(c*x)^2 + 96*(3*(a^2 - 2*b^2)*c^4*d^3 - 4*b^2*c^2*d*e
```

```
^2)*x + 18*(8*a*b*c^4*e^3*x^4 + 32*a*b*c^4*d*e^2*x^3 + 48*a*b*c^4*d^2*e*x^2
 + 32*a*b*c^4*d^3*x - 24*a*b*c^2*d^2*e - 3*a*b*e^3)*arcsin(c*x) + 6*(6*a*b*
c^3*e^3*x^3 + 32*a*b*c^3*d*e^2*x^2 + 96*a*b*c^3*d^3 + 64*a*b*c*d*e^2 + 9*(8
*a*b*c^3*d^2*e + a*b*c*e^3)*x + (6*b^2*c^3*e^3*x^3 + 32*b^2*c^3*d*e^2*x^2 +
 96*b^2*c^3*d^3 + 64*b^2*c*d*e^2 + 9*(8*b^2*c^3*d^2*e + b^2*c*e^3)*x)*arcsi
n(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 743 vs. $2(364) = 728$.

Time = 0.48 (sec) , antiderivative size = 743, normalized size of antiderivative = 1.99

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2d^3x + \frac{3a^2d^2ex^2}{2} + a^2de^2x^3 + \frac{a^2e^3x^4}{4} + 2abd^3x\operatorname{asin}(cx) + 3abd^2ex^2\operatorname{asin}(cx) + 2abde^2x^3\operatorname{asin}(cx) + \frac{abe^3x \\ a^2\left(d^3x + \frac{3d^2ex^2}{2} + de^2x^3 + \frac{e^3x^4}{4}\right) \end{cases}$$

```
[In] integrate((e*x+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**3*x + 3*a**2*d**2*e*x**2/2 + a**2*d*e**2*x**3 + a**2*e**
3*x**4/4 + 2*a*b*d**3*x*asin(c*x) + 3*a*b*d**2*e*x**2*asin(c*x) + 2*a*b*d*e
**2*x**3*asin(c*x) + a*b*e**3*x**4*asin(c*x)/2 + 2*a*b*d**3*sqrt(-c**2*x**2
 + 1)/c + 3*a*b*d**2*e*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*d*e**2*x**2*sqr
t(-c**2*x**2 + 1)/(3*c) + a*b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(8*c) - 3*a*b*
d**2*e*asin(c*x)/(2*c**2) + 4*a*b*d*e**2*sqrt(-c**2*x**2 + 1)/(3*c**3) + 3*
a*b*e**3*x*sqrt(-c**2*x**2 + 1)/(16*c**3) - 3*a*b*e**3*asin(c*x)/(16*c**4)
+ b**2*d**3*x*asin(c*x)**2 - 2*b**2*d**3*x + 3*b**2*d**2*e*x**2*asin(c*x)**
2/2 - 3*b**2*d**2*e*x**2/4 + b**2*d*e**2*x**3*asin(c*x)**2 - 2*b**2*d*e**2*
x**3/9 + b**2*e**3*x**4*asin(c*x)**2/4 - b**2*e**3*x**4/32 + 2*b**2*d**3*sq
rt(-c**2*x**2 + 1)*asin(c*x)/c + 3*b**2*d**2*e*x*sqrt(-c**2*x**2 + 1)*asin(
c*x)/(2*c) + 2*b**2*d*e**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c) + b**2
*e**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*c) - 3*b**2*d**2*e*asin(c*x)**
2/(4*c**2) - 4*b**2*d*e**2*x/(3*c**2) - 3*b**2*e**3*x**2/(32*c**2) + 4*b**2
*d*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 3*b**2*e**3*x*sqrt(-c**2*
x**2 + 1)*asin(c*x)/(16*c**3) - 3*b**2*e**3*asin(c*x)**2/(32*c**4), Ne(c, 0
)), (a**2*(d**3*x + 3*d**2*e*x**2/2 + d*e**2*x**3 + e**3*x**4/4), True))
```

Maxima [F]

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx=\int (ex+d)^3(b\arcsin{(cx)}+a)^2\,dx$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*e^3*x^4 + a^2*d*e^2*x^3 + b^2*d^3*x*arcsin(c*x)^2 + 3/2*a^2*d^2*e*x
^2 + 3/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3
))*a*b*d^2*e + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*s
qrt(-c^2*x^2 + 1)/c^4))*a*b*d*e^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*
x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e
^3 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^3*x + 2*(c*x*
arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^3/c + 1/4*(b^2*e^3*x^4 + 4*b^2*d*e^
2*x^3 + 6*b^2*d^2*e*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + int
egrate(1/2*(b^2*c*e^3*x^4 + 4*b^2*c*d*e^2*x^3 + 6*b^2*c*d^2*e*x^2)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 -
1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 816 vs. $2(334) = 668$.

Time = 0.31 (sec) , antiderivative size = 816, normalized size of antiderivative = 2.18

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx = \frac{1}{4}\,a^2e^3x^4 + a^2de^2x^3 + b^2d^3x\arcsin(cx)^2 + 2\,abd^3x\arcsin(cx) + \frac{(c^2x^2-1)b^2de^2x\arcsin(cx)^2}{c^2} + \frac{3\sqrt{-c^2x^2+1}b^2d^2ex\arcsin(cx)}{2\,c} + a^2d^3x - 2\,b^2d^3x + \frac{2\,(c^2x^2-1)abde^2x\arcsin(cx)}{c^2} + \frac{3\,(c^2x^2-1)b^2d^2e\arcsin(cx)^2}{2\,c^2} + \frac{b^2de^2x\arcsin(cx)^2}{c^2} + \frac{3\sqrt{-c^2x^2+1}abd^2ex}{2\,c} + \frac{2\sqrt{-c^2x^2+1}b^2d^3\arcsin(cx)}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}b^2e^3x\arcsin(cx)}{8\,c^3} - \frac{2\,(c^2x^2-1)b^2de^2x}{9\,c^2} + \frac{3\,(c^2x^2-1)abd^2e\arcsin(cx)}{c^2} + \frac{2\,abde^2x\arcsin(cx)}{c^2} + \frac{3\,b^2d^2e\arcsin(cx)^2}{4\,c^2} + \frac{(c^2x^2-1)^2b^2e^3\arcsin(cx)^2}{4\,c^4} + \frac{2\sqrt{-c^2x^2+1}abd^3}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}abe^3x}{8\,c^3} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2de^2\arcsin(cx)}{3\,c^3} + \frac{5\sqrt{-c^2x^2+1}b^2e^3x\arcsin(cx)}{16\,c^3} + \frac{3\,(c^2x^2-1)a^2d^2e}{2\,c^2} - \frac{3\,(c^2x^2-1)b^2d^2e}{4\,c^2} - \frac{14\,b^2de^2x}{9\,c^2} + \frac{3\,abd^2e\arcsin(cx)}{2\,c^2} + \frac{(c^2x^2-1)^2abe^3\arcsin(cx)}{2\,c^4} + \frac{(c^2x^2-1)b^2e^3\arcsin(cx)^2}{2\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abde^2}{3\,c^3} + \frac{5\sqrt{-c^2x^2+1}abe^3x}{16\,c^3} + \frac{2\sqrt{-c^2x^2+1}b^2de^2\arcsin(cx)}{c^3} - \frac{3\,b^2d^2e}{8\,c^2} - \frac{(c^2x^2-1)^2b^2e^3}{32\,c^4} + \frac{(c^2x^2-1)abe^3\arcsin(cx)}{c^4} + \frac{5\,b^2e^3\arcsin(cx)^2}{32\,c^4} + \frac{2\sqrt{-c^2x^2+1}abde^2}{c^3} - \frac{5\,(c^2x^2-1)b^2e^3}{32\,c^4} + \frac{5\,abe^3\arcsin(cx)}{16\,c^4} - \frac{17\,b^2e^3}{256\,c^4}$$

```
[In] integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/4*a^2*e^3*x^4 + a^2*d*e^2*x^3 + b^2*d^3*x*arcsin(c*x)^2 + 2*a*b*d^3*x*arc
sin(c*x) + (c^2*x^2 - 1)*b^2*d*e^2*x*arcsin(c*x)^2/c^2 + 3/2*sqrt(-c^2*x^2
+ 1)*b^2*d^2*e*x*arcsin(c*x)/c + a^2*d^3*x - 2*b^2*d^3*x + 2*(c^2*x^2 - 1)*
a*b*d*e^2*x*arcsin(c*x)/c^2 + 3/2*(c^2*x^2 - 1)*b^2*d^2*e*arcsin(c*x)^2/c^2
 + b^2*d*e^2*x*arcsin(c*x)^2/c^2 + 3/2*sqrt(-c^2*x^2 + 1)*a*b*d^2*e*x/c + 2
*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*e^
3*x*arcsin(c*x)/c^3 - 2/9*(c^2*x^2 - 1)*b^2*d*e^2*x/c^2 + 3*(c^2*x^2 - 1)*a
*b*d^2*e*arcsin(c*x)/c^2 + 2*a*b*d*e^2*x*arcsin(c*x)/c^2 + 3/4*b^2*d^2*e*ar
csin(c*x)^2/c^2 + 1/4*(c^2*x^2 - 1)^2*b^2*e^3*arcsin(c*x)^2/c^4 + 2*sqrt(-c
^2*x^2 + 1)*a*b*d^3/c - 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*e^3*x/c^3 - 2/3*(-c^2*
x^2 + 1)^(3/2)*b^2*d*e^2*arcsin(c*x)/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*b^2*e^3*
x*arcsin(c*x)/c^3 + 3/2*(c^2*x^2 - 1)*a^2*d^2*e/c^2 - 3/4*(c^2*x^2 - 1)*b^2
*d^2*e/c^2 - 14/9*b^2*d*e^2*x/c^2 + 3/2*a*b*d^2*e*arcsin(c*x)/c^2 + 1/2*(c^
2*x^2 - 1)^2*a*b*e^3*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)*b^2*e^3*arcsin(c*x
)^2/c^4 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d*e^2/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*
a*b*e^3*x/c^3 + 2*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(c*x)/c^3 - 3/8*b^2*d^
2*e/c^2 - 1/32*(c^2*x^2 - 1)^2*b^2*e^3/c^4 + (c^2*x^2 - 1)*a*b*e^3*arcsin(c
*x)/c^4 + 5/32*b^2*e^3*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*e^2/c
^3 - 5/32*(c^2*x^2 - 1)*b^2*e^3/c^4 + 5/16*a*b*e^3*arcsin(c*x)/c^4 - 17/256
*b^2*e^3/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^3\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x)^3,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x)^3, x)
```

3.10 $\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 242

$$\begin{aligned}\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = {} & -2b^2d^2x-\frac{4b^2e^2x}{9c^2}-\frac{1}{2}b^2dex^2-\frac{2}{27}b^2e^2x^3 \\ & +\frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\ & +\frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\ & +\frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\ & +\frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\ & -\frac{d^3(a+b\arcsin(cx))^2}{3e}-\frac{de(a+b\arcsin(cx))^2}{2c^2} \\ & +\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}\end{aligned}$$

```
[Out] -2*b^2*d^2*x-4/9*b^2*e^2*x/c^2-1/2*b^2*d*e*x^2-2/27*b^2*e^2*x^3-1/3*d^3*(a+
b*arcsin(c*x))^2/e-1/2*d*e*(a+b*arcsin(c*x))^2/c^2+1/3*(e*x+d)^3*(a+b*arcsi
n(c*x))^2/e+2*b*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/9*b*e^2*(a+b*a
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+b*d*e*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(
1/2)/c+2/9*b*e^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4827, 4847, 4737, 4767, 8, 4795, 30}

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} - \frac{de(a+b\arcsin(cx))^2}{2c^2} + \frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} - \frac{d^3(a+b\arcsin(cx))^2}{3e} + \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \frac{4b^2e^2x}{9c^2} - 2b^2d^2x - \frac{1}{2}b^2dex^2 - \frac{2}{27}b^2e^2x^3$$

```
[In] Int[(d + e*x)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^2*x - (4*b^2*e^2*x)/(9*c^2) - (b^2*d*e*x^2)/2 - (2*b^2*e^2*x^3)/27
 + (2*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (4*b*e^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (b*d*e*x*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/c + (2*b*e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) -
(d^3*(a + b*ArcSin[c*x])^2)/(3*e) - (d*e*(a + b*ArcSin[c*x])^2)/(2*c^2) + (
(d + e*x)^3*(a + b*ArcSin[c*x])^2)/(3*e)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \frac{(2bc)\int \frac{(d+ex)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3e}$$

$$= \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \frac{(2bc)\int \left(\frac{d^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{3d^2ex(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{3de^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{e^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{3e}$$

$$
\begin{aligned}
&= \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \left(2bcd^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \frac{\left(2bcd^3\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{3e} - (2bcde)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \frac{1}{3}\left(2bce^2\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} - \frac{d^3(a+b\arcsin(cx))^2}{3e} \\
&\quad + \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \left(2b^2d^2\right)\int 1\,dx - \left(b^2de\right)\int x\,dx \\
&\quad - \frac{(bde)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{c} - \frac{1}{9}\left(2b^2e^2\right)\int x^2\,dx - \frac{\left(4be^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c} \\
&= -2b^2d^2x - \frac{1}{2}b^2dex^2 - \frac{2}{27}b^2e^2x^3 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} - \frac{d^3(a+b\arcsin(cx))^2}{3e} \\
&\quad - \frac{de(a+b\arcsin(cx))^2}{2c^2} + \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \frac{\left(4b^2e^2\right)\int 1\,dx}{9c^2} \\
&= -2b^2d^2x - \frac{4b^2e^2x}{9c^2} - \frac{1}{2}b^2dex^2 - \frac{2}{27}b^2e^2x^3 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} - \frac{d^3(a+b\arcsin(cx))^2}{3e} \\
&\quad - \frac{de(a+b\arcsin(cx))^2}{2c^2} + \frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.03

$$
\int (d+ex)^2(a+b\arcsin(cx))^2\,dx
$$

$$
= \frac{18a^2c^3x(3d^2+3dex+e^2x^2) + 6ab\sqrt{1-c^2x^2}(4e^2+c^2(18d^2+9dex+2e^2x^2)) - b^2cx(24e^2+c^2(108d^2+27
$$

```
[In] Integrate[(d + e*x)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (18*a^2*c^3*x*(3*d^2 + 3*d*e*x + e^2*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(4*e^2
+ c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)) - b^2*c*x*(24*e^2 + c^2*(108*d^2 + 27
*d*e*x + 4*e^2*x^2)) + 6*b*(-9*a*c*d*e + 6*a*c^3*x*(3*d^2 + 3*d*e*x + e^2*x
^2) + b*Sqrt[1 - c^2*x^2]*(4*e^2 + c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)))*Arc
Sin[c*x] + 9*b^2*c*(6*c^2*d^2*x + 2*c^2*e^2*x^3 + 3*d*e*(-1 + 2*c^2*x^2))*A
rcSin[c*x]^2)/(54*c^3)
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.55

method	result
derivativedivides	$\frac{\frac{a^2(cex+dc)^3}{3c^2e}+\frac{b^2\left(d^2c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(\cdots\right.}{2}\cdots\right.}{c^2}\cdots}{\cdots}$
default	$\frac{\frac{a^2(cex+dc)^3}{3c^2e}+\frac{b^2\left(d^2c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(\cdots\right.}{2}\cdots\right.}{c^2}\cdots}{\cdots}$
parts	$\frac{a^2(ex+d)^3}{3e}+\frac{b^2\left(18\arcsin(cx)^2c^3x^3e^2+54\arcsin(cx)^2c^3x^2de+54\arcsin(cx)^2c^3x\,d^2+12\sqrt{-c^2x^2+1}\,\arcsin(cx)c^2x^2e^2\cdots\right.}{\cdots}$

```
[In] int((e*x+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(1/3*a^2/c^2*(c*e*x+c*d)^3/e+b^2/c^2*(d^2*c^2*(c*x*arcsin(c*x)^2-2*c*x+
2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+1/2*d*c*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^
2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/27*e^2*(9*c^3*x^3*a
rcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)-12*c*x))+2*a*b/c^2*(1/3/e*arcsin(c*x)*c^3*d^3+arcsin
(c*x)*c^3*d^2*x+e*arcsin(c*x)*c^3*d*x^2+1/3*arcsin(c*x)*e^2*c^3*x^3-1/3/e*(
c^3*d^3*arcsin(c*x)+e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(
1/2))-3*(-c^2*x^2+1)^(1/2)*c^2*d^2*e+3*d*c*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)
+1/2*arcsin(c*x)))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.20

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$

$$=\frac{2\,(9\,a^2-2\,b^2)c^3e^2x^3+27\,(2\,a^2-b^2)c^3dex^2+9\,(2\,b^2c^3e^2x^3+6\,b^2c^3dex^2+6\,b^2c^3d^2x-3\,b^2cde)\arcsin{(cx)}\cdots}{\cdots}$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/54*(2*(9*a^2 - 2*b^2)*c^3*e^2*x^3 + 27*(2*a^2 - b^2)*c^3*d*e*x^2 + 9*(2*b
^2*c^3*e^2*x^3 + 6*b^2*c^3*d*e*x^2 + 6*b^2*c^3*d^2*x - 3*b^2*c*d*e)*arcsin(
c*x)^2 + 6*(9*(a^2 - 2*b^2)*c^3*d^2 - 4*b^2*c*e^2)*x + 18*(2*a*b*c^3*e^2*x^
3 + 6*a*b*c^3*d*e*x^2 + 6*a*b*c^3*d^2*x - 3*a*b*c*d*e)*arcsin(c*x) + 6*(2*a
*b*c^2*e^2*x^2 + 9*a*b*c^2*d*e*x + 18*a*b*c^2*d^2 + 4*a*b*e^2 + (2*b^2*c^2*
e^2*x^2 + 9*b^2*c^2*d*e*x + 18*b^2*c^2*d^2 + 4*b^2*e^2)*arcsin(c*x))*sqrt(-
c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.88

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases} a^2d^2x + a^2dex^2 + \frac{a^2e^2x^3}{3} + 2abd^2x\operatorname{asin}(cx) + 2abdex^2\operatorname{asin}(cx) + \frac{2abe^2x^3\operatorname{asin}(cx)}{3} + \frac{2abd^2\sqrt{-c^2x^2+1}}{c} + \frac{abdex\sqrt{-}}{c} \\ a^2\left(d^2x + dex^2 + \frac{e^2x^3}{3}\right) \end{cases}$$

```
[In] integrate((e*x+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x + a**2*d*e*x**2 + a**2*e**2*x**3/3 + 2*a*b*d**2*x*as
in(c*x) + 2*a*b*d*e*x**2*asin(c*x) + 2*a*b*e**2*x**3*asin(c*x)/3 + 2*a*b*d*
*2*sqrt(-c**2*x**2 + 1)/c + a*b*d*e*x*sqrt(-c**2*x**2 + 1)/c + 2*a*b*e**2*x
**2*sqrt(-c**2*x**2 + 1)/(9*c) - a*b*d*e*asin(c*x)/c**2 + 4*a*b*e**2*sqrt(-
c**2*x**2 + 1)/(9*c**3) + b**2*d**2*x*asin(c*x)**2 - 2*b**2*d**2*x + b**2*d
*e*x**2*asin(c*x)**2 - b**2*d*e*x**2/2 + b**2*e**2*x**3*asin(c*x)**2/3 - 2*
b**2*e**2*x**3/27 + 2*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + b**2*d*e
*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*e**2*x**2*sqrt(-c**2*x**2 + 1)
*asin(c*x)/(9*c) - b**2*d*e*asin(c*x)**2/(2*c**2) - 4*b**2*e**2*x/(9*c**2)
+ 4*b**2*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3), Ne(c, 0)), (a**2*(d*
*2*x + d*e*x**2 + e**2*x**3/3), True))
```

Maxima [F]

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = \int (ex+d)^2(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*e^2*x^3 + b^2*d^2*x*arcsin(c*x)^2 + a^2*d*e*x^2 + (2*x^2*arcsin(c*x
) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*e + 2/9*(3*x^3*ar
csin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*
```

```
e^2 - 2*b^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 2*(c*x
*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^2/c + 1/3*(b^2*e^2*x^3 + 3*b^2*d*e
*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(2/3*(b^2*c*e
^2*x^3 + 3*b^2*c*d*e*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 487 vs. $2(218) = 436$.

Time = 0.31 (sec) , antiderivative size = 487, normalized size of antiderivative = 2.01

$$\begin{aligned}\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = {} & \frac{1}{3}\,a^2e^2x^3 + b^2d^2x\arcsin{(cx)}^2 + 2\,abd^2x\arcsin{(cx)} \\ & + \frac{(c^2x^2-1)b^2e^2x\arcsin{(cx)}^2}{3\,c^2} \\ & + \frac{\sqrt{-c^2x^2+1}b^2dex\arcsin{(cx)}}{c} + a^2d^2x \\ & - 2\,b^2d^2x + \frac{2\,(c^2x^2-1)abe^2x\arcsin{(cx)}}{3\,c^2} \\ & + \frac{(c^2x^2-1)b^2de\arcsin{(cx)}^2}{c^2} + \frac{b^2e^2x\arcsin{(cx)}^2}{3\,c^2} \\ & + \frac{\sqrt{-c^2x^2+1}abdex}{c} + \frac{2\,\sqrt{-c^2x^2+1}b^2d^2\arcsin{(cx)}}{c} \\ & - \frac{2\,(c^2x^2-1)b^2e^2x}{27\,c^2} + \frac{2\,(c^2x^2-1)abde\arcsin{(cx)}}{c^2} \\ & + \frac{2\,abe^2x\arcsin{(cx)}}{3\,c^2} + \frac{b^2de\arcsin{(cx)}^2}{2\,c^2} \\ & + \frac{2\,\sqrt{-c^2x^2+1}abd^2}{c} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2e^2\arcsin{(cx)}}{9\,c^3} \\ & + \frac{(c^2x^2-1)a^2de}{c^2} - \frac{(c^2x^2-1)b^2de}{2\,c^2} - \frac{14\,b^2e^2x}{27\,c^2} \\ & + \frac{abde\arcsin{(cx)}}{c^2} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abe^2}{9\,c^3} \\ & + \frac{2\,\sqrt{-c^2x^2+1}b^2e^2\arcsin{(cx)}}{3\,c^3} \\ & - \frac{b^2de}{4\,c^2} + \frac{2\,\sqrt{-c^2x^2+1}abe^2}{3\,c^3}\end{aligned}$$

```
[In] integrate((e*x+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/3*a^2*e^2*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 2*a*b*d^2*x*arcsin(c*x) + 1/3*(
c^2*x^2 - 1)*b^2*e^2*x*arcsin(c*x)^2/c^2 + sqrt(-c^2*x^2 + 1)*b^2*d*e*x*arc
sin(c*x)/c + a^2*d^2*x - 2*b^2*d^2*x + 2/3*(c^2*x^2 - 1)*a*b*e^2*x*arcsin(c
```

```
*x)/c^2 + (c^2*x^2 - 1)*b^2*d*e*arcsin(c*x)^2/c^2 + 1/3*b^2*e^2*x*arcsin(c*
x)^2/c^2 + sqrt(-c^2*x^2 + 1)*a*b*d*e*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d^2*ar
csin(c*x)/c - 2/27*(c^2*x^2 - 1)*b^2*e^2*x/c^2 + 2*(c^2*x^2 - 1)*a*b*d*e*ar
csin(c*x)/c^2 + 2/3*a*b*e^2*x*arcsin(c*x)/c^2 + 1/2*b^2*d*e*arcsin(c*x)^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e^2*arcs
in(c*x)/c^3 + (c^2*x^2 - 1)*a^2*d*e/c^2 - 1/2*(c^2*x^2 - 1)*b^2*d*e/c^2 - 1
4/27*b^2*e^2*x/c^2 + a*b*d*e*arcsin(c*x)/c^2 - 2/9*(-c^2*x^2 + 1)^(3/2)*a*b
*e^2/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c^3 - 1/4*b^2*d*e/c^2
 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^2\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x)^2,x)
[Out] int((a + b*asin(c*x))^2*(d + e*x)^2, x)
```

3.11 $\int (d+ex)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 16, antiderivative size = 142

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = -2b^2dx-\frac{1}{4}b^2ex^2+\frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{bex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}-\frac{d^2(a+b\arcsin(cx))^2}{2e}-\frac{e(a+b\arcsin(cx))^2}{4c^2}+\frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e}$$

```
[Out] -2*b^2*d*x-1/4*b^2*e*x^2-1/2*d^2*(a+b*arcsin(c*x))^2/e-1/4*e*(a+b*arcsin(c*
x))^2/c^2+1/2*(e*x+d)^2*(a+b*arcsin(c*x))^2/e+2*b*d*(a+b*arcsin(c*x))*(-c^2
*x^2+1)^(1/2)/c+1/2*b*e*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4827, 4847, 4737, 4767, 8, 4795, 30}

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{bex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}-\frac{e(a+b\arcsin(cx))^2}{4c^2}-\frac{d^2(a+b\arcsin(cx))^2}{2e}+\frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e}-2b^2dx-\frac{1}{4}b^2ex^2$$

```
[In] Int[(d + e*x)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*x - (b^2*e*x^2)/4 + (2*b*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c + (b*e*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c) - (d^2*(a + b*ArcSi
n[c*x])^2)/(2*e) - (e*(a + b*ArcSin[c*x])^2)/(4*c^2) + ((d + e*x)^2*(a + b*
ArcSin[c*x])^2)/(2*e)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} - \frac{(bc)\int \frac{(d+ex)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{e} \\
&= \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} \\
&\quad - \frac{(bc)\int \left(\frac{d^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{2dex(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{e^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{e} \\
&= \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} - (2bcd)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \frac{(bcd^2)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{e} - (bce)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} - \frac{d^2(a+b\arcsin(cx))^2}{2e} \\
&\quad + \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} - (2b^2d)\int 1\,dx - \frac{1}{2}(b^2e)\int x\,dx - \frac{(be)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c} \\
&= -2b^2dx - \frac{1}{4}b^2ex^2 + \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad - \frac{d^2(a+b\arcsin(cx))^2}{2e} - \frac{e(a+b\arcsin(cx))^2}{4c^2} + \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.08

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} - \frac{b\left(2bdex + \frac{1}{4}be^2x^2 - \frac{2de\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} - \frac{e^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} + \frac{d^2(a+b\arcsin(cx))^2}{2b} + \frac{e^2(a+b\arcsin(cx))^2}{4bc^2}\right.}{e}$$

```
[In] Integrate[(d + e*x)*(a + b*ArcSin[c*x])^2,x]
```

[Out] ((d + e*x)^2*(a + b*ArcSin[c*x])^2)/(2*e) - (b*(2*b*d*e*x + (b*e^2*x^2)/4 - (2*d*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c - (e^2*x*Sqrt[1 - c^2*x^2] *(a + b*ArcSin[c*x]))/(2*c) + (d^2*(a + b*ArcSin[c*x])^2)/(2*b) + (e^2*(a + b*ArcSin[c*x])^2)/(4*b*c^2)))/e

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.33

method	result
parts	$a^2\left(\frac{1}{2}e\,x^2+dx\right)+\frac{b^2\left(\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(cx)^2-c^2x^2\right)}{4c}+d\left(cx\arcsin(cx)^2-2cx+2\,\text{arc}\right.}{c}$
derivativedivides	$\frac{\frac{a^2\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(\right.}{4}}{c}}{c}$
default	$\frac{\frac{a^2\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(\right.}{4}}{c}}{c}$

[In] int((e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] a^2*(1/2*e*x^2+d*x)+b^2/c*(1/4*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)/c+d*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/c*(1/2*c*arcsin(c*x)*x^2*e+arcsin(c*x)*d*c*x-1/2/c*(e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-2*d*c*(-c^2*x^2+1)^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.10

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \frac{(2\,a^2-b^2)c^2ex^2+4\,(a^2-2\,b^2)c^2dx+(2\,b^2c^2ex^2+4\,b^2c^2dx-b^2e)\arcsin(cx)^2+2\,(2\,abc^2ex^2+4\,abc^2dx-}{4\,c^2}$$

[In] integrate((e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] 1/4*((2*a^2 - b^2)*c^2*e*x^2 + 4*(a^2 - 2*b^2)*c^2*d*x + (2*b^2*c^2*e*x^2 + 4*b^2*c^2*d*x - b^2*e)*arcsin(c*x)^2 + 2*(2*a*b*c^2*e*x^2 + 4*a*b*c^2*d*x - a*b*e)*arcsin(c*x) + 2*(a*b*c*e*x + 4*a*b*c*d + (b^2*c*e*x + 4*b^2*c*d)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2

Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.64

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2dx + \frac{a^2ex^2}{2} + 2abdx\operatorname{asin}(cx) + abex^2\operatorname{asin}(cx) + \frac{2abd\sqrt{-c^2x^2+1}}{c} + \frac{abex\sqrt{-c^2x^2+1}}{2c} - \frac{abe\operatorname{asin}(cx)}{2c^2} + b^2dx\operatorname{asin}^2 \\ a^2\left(dx + \frac{ex^2}{2}\right) \end{cases}$$

```
[In] integrate((e*x+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x + a**2*e*x**2/2 + 2*a*b*d*x*asin(c*x) + a*b*e*x**2*asin
(c*x) + 2*a*b*d*sqrt(-c**2*x**2 + 1)/c + a*b*e*x*sqrt(-c**2*x**2 + 1)/(2*c)
 - a*b*e*asin(c*x)/(2*c**2) + b**2*d*x*asin(c*x)**2 - 2*b**2*d*x + b**2*e*x
**2*asin(c*x)**2/2 - b**2*e*x**2/4 + 2*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x
)/c + b**2*e*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) - b**2*e*asin(c*x)**2/(
4*c**2), Ne(c, 0)), (a**2*(d*x + e*x**2/2), True))
```

Maxima [F]

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \int (ex+d)(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] b^2*d*x*arcsin(c*x)^2 + 1/2*a^2*e*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c
^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e + 1/2*(x^2*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2 + 2*c*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^2*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x))*b^2*e - 2*b^2*
d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + s
qrt(-c^2*x^2 + 1))*a*b*d/c
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.72

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = b^2dx\arcsin(cx)^2 + 2\,abdx\arcsin(cx) + \frac{\sqrt{-c^2x^2+1}b^2ex\arcsin(cx)}{2\,c} + a^2dx - 2\,b^2dx + \frac{(c^2x^2-1)b^2e\arcsin(cx)^2}{2\,c^2} + \frac{\sqrt{-c^2x^2+1}abex}{2\,c} + \frac{2\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{c} + \frac{(c^2x^2-1)abe\arcsin(cx)}{c^2} + \frac{b^2e\arcsin(cx)^2}{4\,c^2} + \frac{2\sqrt{-c^2x^2+1}abd}{c} + \frac{(c^2x^2-1)a^2e}{2\,c^2} - \frac{(c^2x^2-1)b^2e}{4\,c^2} + \frac{abe\arcsin(cx)}{2\,c^2} - \frac{b^2e}{8\,c^2}$$

```
[In] integrate((e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*d*x*arcsin(c*x)^2 + 2*a*b*d*x*arcsin(c*x) + 1/2*sqrt(-c^2*x^2 + 1)*b^2*
e*x*arcsin(c*x)/c + a^2*d*x - 2*b^2*d*x + 1/2*(c^2*x^2 - 1)*b^2*e*arcsin(c*
x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*ar
csin(c*x)/c + (c^2*x^2 - 1)*a*b*e*arcsin(c*x)/c^2 + 1/4*b^2*e*arcsin(c*x)^2
/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d/c + 1/2*(c^2*x^2 - 1)*a^2*e/c^2 - 1/4*(c^
2*x^2 - 1)*b^2*e/c^2 + 1/2*a*b*e*arcsin(c*x)/c^2 - 1/8*b^2*e/c^2
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x), x)
```

3.12 $\int (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 10, antiderivative size = 47

$$\int (a+b\arcsin(cx))^2\,dx=-2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2$$

```
[Out] -2*b^2*x+x*(a+b*arcsin(c*x))^2+2*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4715, 4767, 8}

$$\int (a+b\arcsin(cx))^2\,dx=\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2-2b^2x$$

```
[In] Int[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= x(a+b\arcsin(cx))^2-(2bc)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\ &= \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2-\left(2b^2\right)\int 1\,dx\\ &= -2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int(a+b\arcsin(cx))^2\,dx=-2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2,x]
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Maple [A] (verified)

Time = 0.00 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

method	result	size
derivativedivides	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72
default	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72
parts	$a^2x+\frac{b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)}{c}+\frac{2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	73

```
[In] int((a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(c*x*a^2+b^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
+2*a*b*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.38

$$\int (a+b\arcsin(cx))^2\,dx = \frac{b^2cx\arcsin(cx)^2+2\,abcx\arcsin(cx)+(a^2-2\,b^2)cx+2\,\sqrt{-c^2x^2+1}(b^2\arcsin(cx)+ab)}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] (b^2*c*x*arcsin(c*x)^2 + 2*a*b*c*x*arcsin(c*x) + (a^2 - 2*b^2)*c*x + 2*sqrt
(-c^2*x^2 + 1)*(b^2*arcsin(c*x) + a*b))/c
```

Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.74

$$\int (a+b\arcsin(cx))^2\,dx = \begin{cases} a^2x+2abx\,\mathrm{asin}\,(cx)+\frac{2ab\sqrt{-c^2x^2+1}}{c}+b^2x\,\mathrm{asin}^2\,(cx)-2b^2x+\frac{2b^2\sqrt{-c^2x^2+1}\,\mathrm{asin}\,(cx)}{c} & \text{for } c\neq 0 \\ a^2x & \text{otherwise} \end{cases}$$

```
[In] integrate((a+b*asin(c*x))**2,x)
[Out] Piecewise((a**2*x + 2*a*b*x*asin(c*x) + 2*a*b*sqrt(-c**2*x**2 + 1)/c + b**2
*x*asin(c*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c, Ne(c,
 0)), (a**2*x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

$$\int (a+b\arcsin(cx))^2\,dx = b^2x\arcsin(cx)^2-2\,b^2\left(x-\frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)+a^2x+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)ab}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] b^2*x*arcsin(c*x)^2 - 2*b^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*x
+ 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b/c
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

$$\int (a+b\arcsin(cx))^2\,dx = b^2x\arcsin{(cx)}^2 + 2\,abx\arcsin{(cx)} + a^2x - 2\,b^2x + \frac{2\,\sqrt{-c^2x^2+1}b^2\arcsin{(cx)}}{c} + \frac{2\,\sqrt{-c^2x^2+1}ab}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x - 2*b^2*x + 2*sqrt(-c^2*x
^2 + 1)*b^2*arcsin(c*x)/c + 2*sqrt(-c^2*x^2 + 1)*a*b/c
```

Mupad [B] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 142, normalized size of antiderivative = 3.02

$$\int (a+b\arcsin(cx))^2\,dx = \begin{cases} b^2\left(x\left(\mathrm{asin}(c\,x)^2-2\right)+2\,\mathrm{asin}(c\,x)\,\sqrt{\frac{1}{c^2}-x^2}\right)+a^2\,x+\frac{2\,a\,b\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if}\ \ 0<c \\ a^2\,x+b^2\,x\,\left(\mathrm{asin}(c\,x)^2-2\right)+\frac{2\,b^2\,\mathrm{asin}(c\,x)\,\sqrt{1-c^2\,x^2}}{c}+\frac{2\,a\,b\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if}\ \ \neg 0<c \end{cases}$$

```
[In] int((a + b*asin(c*x))^2,x)
```

```
[Out] piecewise(0 < c, b^2*(x*(asin(c*x)^2 - 2) + 2*asin(c*x)*(1/c^2 - x^2)^(1/2)
) + a^2*x + (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c, ~0 < c, a^2*
x + b^2*x*(asin(c*x)^2 - 2) + (2*b^2*asin(c*x)*(- c^2*x^2 + 1)^(1/2))/c + (
2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c)
```

3.13 $\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 347

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = & -\frac{i(a+b\arcsin(cx))^3}{3be}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}\\ & +\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\\ & -\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}\\ & -\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\\ & +\frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\end{aligned}$$

```
[Out] -1/3*I*(a+b*arcsin(c*x))^3/b/e+(a+b*arcsin(c*x))^2*ln(1-I*e*(I*c*x+(-c^2*x^
2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e+(a+b*arcsin(c*x))^2*ln(1-I*e*(I*c*
x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e-2*I*b*(a+b*arcsin(c*x))*
polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e-2*I*b
*(a+b*arcsin(c*x))*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e
^2)^(1/2)))/e+2*b^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-
e^2)^(1/2)))/e+2*b^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2
-e^2)^(1/2)))/e
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 347, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4825, 4615, 2221, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = -\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e} - \frac{i(a+b\arcsin(cx))^3}{3be} + \frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x),x]
```

```
[Out] ((-1/3*I)*(a + b*ArcSin[c*x])^3)/(b*e) + ((a + b*ArcSin[c*x])^2*Log[1 - (I*
e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + ((a + b*ArcSin[c*x])
^2*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - ((2*I)
*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d
^2 - e^2])])/e - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e + (2*b^2*PolyLog[3, (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (2*b^2*PolyLog[3, (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)\\ &= -\frac{i(a+b\arcsin(cx))^3}{3be} + \text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{cd-\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right)\\ &\quad + \text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{cd+\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right)\end{aligned}$$

$$= -\frac{i(a+b\arcsin(cx))^3}{3be} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{(2b)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{iee^{ix}}{cd-\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e} - \frac{(2b)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{iee^{ix}}{cd+\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e}$$

$$= -\frac{i(a+b\arcsin(cx))^3}{3be} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(2ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,\frac{iee^{ix}}{cd-\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e} + \frac{(2ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,\frac{iee^{ix}}{cd+\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e}$$

$$= -\frac{i(a+b\arcsin(cx))^3}{3be} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(2b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{iex}{cd-\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e} + \frac{(2b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{iex}{cd+\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e}$$

$$= -\frac{i(a+b\arcsin(cx))^3}{3be} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{2b^2\,\mathrm{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{2b^2\,\mathrm{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.96

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = \frac{-\frac{i(a+b\arcsin(cx))^3}{b} + 3(a+b\arcsin(cx))^2\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right) + 3(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x),x]
```

```
[Out] (((-I)*(a + b*ArcSin[c*x])^3)/b + 3*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(I
*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 3*(a + b*ArcSin[c*x])^2*Lo
g[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] + 6*b*((-I)*(a +
 b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^
2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]) +
 6*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*
d^2 - e^2])]))/(3*e)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{ex+d}\,dx$$

```
[In] int((a+b*arcsin(c*x))^2/(e*x+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x+d),x)
```

Fricas [F]

$$\int \frac{(a + b \arcsin(cx))^2}{d + ex} dx = \int \frac{(b \arcsin(cx) + a)^2}{ex + d} dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e*x + d), x)
```

Sympy [F]

$$\int \frac{(a + b \arcsin(cx))^2}{d + ex} dx = \int \frac{(a + b \operatorname{asin}(cx))^2}{d + ex} dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x+d),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(a + b \arcsin(cx))^2}{d + ex} dx = \int \frac{(b \arcsin(cx) + a)^2}{ex + d} dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*log(e*x + d)/e + integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(e*x + d), x)
```

Giac [F]

$$\int \frac{(a + b \arcsin(cx))^2}{d + ex} dx = \int \frac{(b \arcsin(cx) + a)^2}{ex + d} dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{d+e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d + e*x), x)
```

3.14 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 309

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = -\frac{(a+b\arcsin(cx))^2}{e(d+ex)} - \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} - \frac{2b^2c\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2b^2c\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}}$$

```
[Out] -(a+b*arcsin(c*x))^2/e/(e*x+d)-2*I*b*c*(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-
c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(1/2)+2*I*b*c*
(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1
/2)))/e/(c^2*d^2-e^2)^(1/2)-2*b^2*c*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/(c*d-(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(1/2)+2*b^2*c*polylog(2,I*e*(I
*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4827, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = -\frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e\sqrt{c^2d^2-e^2}} - \frac{(a+b\arcsin(cx))^2}{e(d+ex)} - \frac{2b^2c\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2b^2c\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(e*(d + e*x))) - ((2*I)*b*c*(a + b*ArcSin[c*x])*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e*Sqrt[c^2*d^2
- e^2]) + ((2*I)*b*c*(a + b*ArcSin[c*x])*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c
*d + Sqrt[c^2*d^2 - e^2])])/(e*Sqrt[c^2*d^2 - e^2]) - (2*b^2*c*PolyLog[2, (
I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e*Sqrt[c^2*d^2 - e^2]
) + (2*b^2*c*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])
])/(e*Sqrt[c^2*d^2 - e^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e}\\
&= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{(2bc)\text{Subst}\left(\int\frac{a+bx}{cd+e\sin(x)}\,dx,x,\arcsin(cx)\right)}{e}\\
&= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{(4bc)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ie+2cde^{ix}-iee^{2ix}}\,dx,x,\arcsin(cx)\right)}{e}\\
&= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)}-\frac{(4ibc)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{c^2d^2-e^2}}\\
&\quad+\frac{(4ibc)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{c^2d^2-e^2}}
\end{aligned}
$$

$$= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)} - \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{(2ib^2c)\operatorname{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}} - \frac{(2ib^2c)\operatorname{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}}$$

$$= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)} - \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{(2b^2c)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e\sqrt{c^2d^2-e^2}} - \frac{(2b^2c)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e\sqrt{c^2d^2-e^2}}$$

$$= -\frac{(a+b\arcsin(cx))^2}{e(d+ex)} - \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2ibc(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} - \frac{2b^2c\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}} + \frac{2b^2c\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 231, normalized size of antiderivative = 0.75

$$\int\frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$

$$= \frac{-\frac{(a+b\arcsin(cx))^2}{d+ex} + \frac{2bc\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)+b\operatorname{PolyLo}}{\sqrt{c^2d^2-e^2}}}{e}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x)^2,x]
```

```
[Out] (-((a + b*ArcSin[c*x])^2/(d + e*x)) + (2*b*c*((-I)*(a + b*ArcSin[c*x])*(Log
[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e
*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*
ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[
c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2])/e
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 641 vs. $2(319) = 638$.

Time = 0.78 (sec) , antiderivative size = 642, normalized size of antiderivative = 2.08

method	result
derivativedivides	$\frac{-\frac{a^2c^2}{(cex+dc)e}+b^2c^2\left(-\frac{\arcsin(cx)^2}{e(cex+dc)}-\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{e\left(c^2d^2-e^2\right)}+\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(c}{}\right.}{}$
default	$\frac{-\frac{a^2c^2}{(cex+dc)e}+b^2c^2\left(-\frac{\arcsin(cx)^2}{e(cex+dc)}-\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{e\left(c^2d^2-e^2\right)}+\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(c}{}\right.}{}$
parts	$-\frac{a^2}{(ex+d)e}+\frac{b^2\left(-\frac{c^2\arcsin(cx)^2}{e(cex+dc)}-\frac{2\sqrt{-c^2d^2+e^2}\,c^2\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{e\left(c^2d^2-e^2\right)}+\frac{2\sqrt{-c^2d^2+e^2}\,c^2}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-a^2*c^2/(c*e*x+c*d)/e+b^2*c^2*(-arcsin(c*x)^2/e/(c*e*x+c*d)-2*(-c^2*d
^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+2*(-c^2*d^2+e^2)^
(1/2)/e/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-
c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I*(-c^2*d^2+e^2)^(1/2)/
e/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1
/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*I*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c
^2*d^2+e^2)^(1/2))))+2*a*b*c^2*(-1/(c*e*x+c*d)/e*arcsin(c*x)-1/e^2/(-(c^2*d
^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^
```

```
2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1
/2))/(c*x+d*c/e)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(ex+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e^2*x^2 + 2*d*e*x +
 d^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2}{(d+ex)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x+d)**2,x)
[Out] Integral((a + b*asin(c*x))**2/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(ex+d\right)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d+e\,x\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x)^2,x)
[Out] int((a + b*asin(c*x))^2/(d + e*x)^2, x)
```

3.15 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 401

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)} - \frac{b^2c^3d\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{b^2c^3d\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}}$$

```
[Out] -1/2*(a+b*arcsin(c*x))^2/e/(e*x+d)^2-b^2*c^2*ln(e*x+d)/e/(c^2*d^2-e^2)-I*b*
c^3*d*(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e
^2)^(1/2)))/e/(c^2*d^2-e^2)^(3/2)+I*b*c^3*d*(a+b*arcsin(c*x))*ln(1-I*e*(I*c
*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(3/2)-b^2
*c^3*d*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/
e/(c^2*d^2-e^2)^(3/2)+b^2*c^3*d*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d+(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(3/2)+b*c*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)/(c^2*d^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 401, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4827, 4857, 3405, 3404, 2296, 2221, 2317, 2438, 2747, 31}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{b^2c^3d\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{b^2c^3d\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((c^2*d^2 - e^2)*(d + e*x)) - (
a + b*ArcSin[c*x])^2/(2*e*(d + e*x)^2) - (I*b*c^3*d*(a + b*ArcSin[c*x])*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e*(c^2*d^2 - e^
2)^(3/2)) + (I*b*c^3*d*(a + b*ArcSin[c*x])*Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d + Sqrt[c^2*d^2 - e^2])])/(e*(c^2*d^2 - e^2)^(3/2)) - (b^2*c^2*Log[d +
e*x])/(e*(c^2*d^2 - e^2)) - (b^2*c^3*d*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(
c*d - Sqrt[c^2*d^2 - e^2])])/(e*(c^2*d^2 - e^2)^(3/2)) + (b^2*c^3*d*PolyLog
[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e*(c^2*d^2 - e^2
)^(3/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
```

```
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\text{integral} = -\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} + \frac{(bc)\int \frac{a+b\arcsin(cx)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{e}$$

$$= -\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} + \frac{(bc^2)\,\text{Subst}\left(\int \frac{a+bx}{(cd+e\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{e}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{(b^2c^2)\,\text{Subst}\left(\int \frac{\cos(x)}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{c^2d^2-e^2} + \frac{(bc^3d)\,\text{Subst}\left(\int \frac{a+bx}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e\,(c^2d^2-e^2)}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{(b^2c^2)\,\text{Subst}\left(\int \frac{1}{cd+x}\,dx, x, cex\right)}{e\,(c^2d^2-e^2)} + \frac{(2bc^3d)\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ie+2cde^{ix}-iee^{2ix}}\,dx, x, \arcsin(cx)\right)}{e\,(c^2d^2-e^2)}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{b^2c^2\log(d+ex)}{e\,(c^2d^2-e^2)} - \frac{(2ibc^3d)\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx, x, \arcsin(cx)\right)}{(c^2d^2-e^2)^{3/2}} + \frac{(2ibc^3d)\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx, x, \arcsin(cx)\right)}{(c^2d^2-e^2)^{3/2}}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)} + \frac{(ib^2c^3d)\operatorname{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{(ib^2c^3d)\operatorname{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e(c^2d^2-e^2)^{3/2}}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)} + \frac{(b^2c^3d)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{(b^2c^3d)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e(c^2d^2-e^2)^{3/2}}$$

$$= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)} - \frac{b^2c^3d\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} + \frac{b^2c^3d\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 315, normalized size of antiderivative = 0.79

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$
$$= \frac{\frac{2bce\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{(d+ex)^2} - \frac{2b^2c^2\log(d+ex)}{c^2d^2-e^2} + \frac{2bc^3d\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{\cdots}}\cdots\right.\right.\right.}{(c^2\cdots}}{2e}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x)^3,x]
```

```
[Out] ((2*b*c*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((c^2*d^2 - e^2)*(d + e*x)
) - (a + b*ArcSin[c*x])^2/(d + e*x)^2 - (2*b^2*c^2*Log[d + e*x])/(c^2*d^2 -
 e^2) + (2*b*c^3*d*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]
))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d +
 Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[
c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2
 - e^2])]))/(c^2*d^2 - e^2)^(3/2))/(2*e)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 965 vs. $2(407) = 814$.

Time = 1.34 (sec) , antiderivative size = 966, normalized size of antiderivative = 2.41

method	result
derivativedivides	$\frac{-\frac{a^2c^3}{2(cex+dc)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+1}\,e^2\cdots\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\cdots\right.}{\cdots}$
default	$\frac{-\frac{a^2c^3}{2(cex+dc)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+1}\,e^2\cdots\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\cdots\right.}{\cdots}$
parts	$-\frac{a^2}{2(ex+d)^2e}+\frac{b^2\left(-\frac{c^3\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+1}\cdots\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\cdots\right.}{\cdots}$

```
[In] int((a+b*arcsin(c*x))^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

[Out] 1/c*(-1/2*a^2*c^3/(c*e*x+c*d)^2/e+b^2*c^3*(-1/2*arcsin(c*x)*(-2*(-c^2*x^2+1
)^(1/2)*c*d*e-e^2*arcsin(c*x)+c^2*d^2*arcsin(c*x)+4*I*c^2*d*e*x+2*I*c^2*d^2
+2*I*e^2*c^2*x^2-2*(-c^2*x^2+1)^(1/2)*e^2*c*x)/(c*e*x+c*d)^2/(c^2*d^2-e^2)/
e-1/e/(c^2*d^2-e^2)*ln(I*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2-2*d*c*(I*c*x+(-c^2*
x^2+1)^(1/2))-I*e)+2/e/(c^2*d^2-e^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/e*(-c^2
*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*d*c*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/e*(-c^2*d
^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*d*c*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)
^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I/e*(-c^2*d^2
+e^2)^(1/2)/(c^2*d^2-e^2)^2*d*c*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(
-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I/e*(-c^2*d^2+e^2)^(1/2)
/(c^2*d^2-e^2)^2*d*c*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))))-a*b*c^3/(c*e*x+c*d)^2/e*arcsin(c*x
)+a*b*c^3/e/(c^2*d^2-e^2)/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(
c^2*d^2-e^2)/e^2)^(1/2)-a*b*c^4/e^2*d/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1
/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/
2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e
)))

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2}{(ex+d)^3}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")

[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e^3*x^3 + 3*d*e^2*x
^2 + 3*d^2*e*x + d^3), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})^2}{(d+ex)^3}\,dx$$

[In] integrate((a+b*asin(c*x))**2/(e*x+d)**3,x)

[Out] Integral((a + b*asin(c*x))**2/(d + e*x)**3, x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a + b \arcsin(cx))^2}{(d + ex)^3} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(a + b \arcsin(cx))^2}{(d + ex)^3} \, dx = \int \frac{(b \arcsin(cx) + a)^2}{(ex + d)^3} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + b \arcsin(cx))^2}{(d + ex)^3} \, dx = \int \frac{(a + b \operatorname{asin}(c x))^2}{(d + e x)^3} \, dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x)^3,x)
```

```
[Out] int((a + b*asin(c*x))^2/(d + e*x)^3, x)
```

3.16 $\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 393

$$\begin{aligned}\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx =\ & \frac{d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}\\ &+\frac{3de^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}\\ &-\frac{3de^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}\\ &-\frac{3d^2e\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2}\\ &-\frac{e^3\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{4bc^4}\\ &+\frac{e^3\,\text{CosIntegral}\left(\frac{4a}{b}+4\arcsin(cx)\right)\sin\left(\frac{4a}{b}\right)}{8bc^4}\\ &+\frac{d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}+\frac{3de^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}\\ &+\frac{3d^2e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}\\ &+\frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4}\\ &-\frac{3de^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}\\ &-\frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4}\end{aligned}$$

```
[Out] d^3*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+3/4*d*e^2*Ci(a/b+arcsin(c*x))*cos(a/b)
/b/c^3-3/4*d*e^2*Ci(3*a/b+3*arcsin(c*x))*cos(3*a/b)/b/c^3+3/2*d^2*e*cos(2*a
/b)*Si(2*a/b+2*arcsin(c*x))/b/c^2+1/4*e^3*cos(2*a/b)*Si(2*a/b+2*arcsin(c*x)
```

```
)/b/c^4-1/8*e^3*cos(4*a/b)*Si(4*a/b+4*arcsin(c*x))/b/c^4+d^3*Si(a/b+arcsin(
c*x))*sin(a/b)/b/c+3/4*d*e^2*Si(a/b+arcsin(c*x))*sin(a/b)/b/c^3-3/2*d^2*e*C
i(2*a/b+2*arcsin(c*x))*sin(2*a/b)/b/c^2-1/4*e^3*Ci(2*a/b+2*arcsin(c*x))*sin
(2*a/b)/b/c^4-3/4*d*e^2*Si(3*a/b+3*arcsin(c*x))*sin(3*a/b)/b/c^3+1/8*e^3*Ci
(4*a/b+4*arcsin(c*x))*sin(4*a/b)/b/c^4
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 393, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4831, 6874, 3384, 3380, 3383, 4491, 12}

$$\begin{aligned}\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = &-\frac{e^3\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4}\\ &+\frac{e^3\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4}\\ &+\frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4}\\ &-\frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4}\\ &+\frac{3de^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}\\ &-\frac{3de^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}\\ &+\frac{3de^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}\\ &-\frac{3de^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}\\ &-\frac{3d^2e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}\\ &+\frac{3d^2e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}\\ &+\frac{d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}\\ &+\frac{d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}\end{aligned}$$

```
[In] Int[(d + e*x)^3/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/(b*c) + (3*d*e^2*Cos[a/b]*Cos
Integral[a/b + ArcSin[c*x]])/(4*b*c^3) - (3*d*e^2*Cos[(3*a)/b]*CosIntegral[
(3*a)/b + 3*ArcSin[c*x]])/(4*b*c^3) - (3*d^2*e*CosIntegral[(2*a)/b + 2*ArcS
in[c*x]]*Sin[(2*a)/b])/(2*b*c^2) - (e^3*CosIntegral[(2*a)/b + 2*ArcSin[c*x]
]*Sin[(2*a)/b])/(4*b*c^4) + (e^3*CosIntegral[(4*a)/b + 4*ArcSin[c*x]]*Sin[(
```

```
4*a)/b])/(8*b*c^4) + (d^3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b*c) +
(3*d*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b*c^3) + (3*d^2*e*Cos[
(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b*c^2) + (e^3*Cos[(2*a)/b
]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(4*b*c^4) - (3*d*e^2*Sin[(3*a)/b]*S
inIntegral[(3*a)/b + 3*ArcSin[c*x]])/(4*b*c^3) - (e^3*Cos[(4*a)/b]*SinInteg
ral[(4*a)/b + 4*ArcSin[c*x]])/(8*b*c^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\cos(x)(cd+e\sin(x))^3}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^4}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{c^3d^3\cos(x)}{a+bx} + \frac{3c^2d^2e\cos(x)\sin(x)}{a+bx} + \frac{3cde^2\cos(x)\sin^2(x)}{a+bx} + \frac{e^3\cos(x)\sin^3(x)}{a+bx}\right)dx, x, \arcsin(cx)\right)}{c^4}$$

$$= \frac{d^3\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c} + \frac{(3d^2e)\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^2} + \frac{(3de^2)\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^3} + \frac{e^3\text{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^4}$$

$$= \frac{(3d^2e)\,\text{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx, x, \arcsin(cx)\right)}{c^2} + \frac{(3de^2)\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \arcsin(cx)\right)}{c^3} + \frac{e^3\text{Subst}\left(\int \left(\frac{\sin(2x)}{4(a+bx)} - \frac{\sin(4x)}{8(a+bx)}\right)dx, x, \arcsin(cx)\right)}{c^4} + \frac{\left(d^3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c} + \frac{\left(d^3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c}$$

$$= \frac{d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{(3d^2e)\,\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{2c^2} + \frac{(3de^2)\,\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{4c^3} - \frac{(3de^2)\,\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{4c^3} - \frac{e^3\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{8c^4} + \frac{e^3\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{4c^4}$$

$$= \frac{d^3 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} + \frac{d^3 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc}$$
$$+ \frac{\left(3de^2 \cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^3}$$
$$+ \frac{\left(3d^2e \cos\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{2c^2}$$
$$+ \frac{\left(e^3 \cos\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^4}$$
$$- \frac{\left(3de^2 \cos\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}+3x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^3}$$
$$- \frac{\left(e^3 \cos\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}+4x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{8c^4}$$
$$+ \frac{\left(3de^2 \sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^3}$$
$$- \frac{\left(3d^2e \sin\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{2c^2}$$
$$- \frac{\left(e^3 \sin\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^4}$$
$$- \frac{\left(3de^2 \sin\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{4c^3}$$
$$+ \frac{\left(e^3 \sin\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}+4x\right)}{a+bx} \, dx, x, \arcsin(cx)\right)}{8c^4}$$

$$= \frac{d^3 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} + \frac{3de^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a}{b} + \arcsin(cx)\right)}{4bc^3}$$
$$- \frac{3de^2 \cos\left(\frac{3a}{b}\right) \text{CosIntegral}\left(\frac{3a}{b} + 3\arcsin(cx)\right)}{4bc^3}$$
$$- \frac{3d^2e \, \text{CosIntegral}\left(\frac{2a}{b} + 2\arcsin(cx)\right) \sin\left(\frac{2a}{b}\right)}{2bc^2}$$
$$- \frac{e^3 \, \text{CosIntegral}\left(\frac{2a}{b} + 2\arcsin(cx)\right) \sin\left(\frac{2a}{b}\right)}{4bc^4}$$
$$+ \frac{e^3 \, \text{CosIntegral}\left(\frac{4a}{b} + 4\arcsin(cx)\right) \sin\left(\frac{4a}{b}\right)}{8bc^4}$$
$$+ \frac{d^3 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} + \frac{3de^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{4bc^3}$$
$$+ \frac{3d^2e \cos\left(\frac{2a}{b}\right) \text{Si}\left(\frac{2a}{b} + 2\arcsin(cx)\right)}{2bc^2} + \frac{e^3 \cos\left(\frac{2a}{b}\right) \text{Si}\left(\frac{2a}{b} + 2\arcsin(cx)\right)}{4bc^4}$$
$$- \frac{3de^2 \sin\left(\frac{3a}{b}\right) \text{Si}\left(\frac{3a}{b} + 3\arcsin(cx)\right)}{4bc^3} - \frac{e^3 \cos\left(\frac{4a}{b}\right) \text{Si}\left(\frac{4a}{b} + 4\arcsin(cx)\right)}{8bc^4}$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 304, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$$
$$= \frac{d^3\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{bc}$$
$$+\frac{3de^2\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+a\right.\right.}{4bc^3}$$
$$+\frac{e^3\left(-2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+2\cos\left(\frac{2a}{b}\right)\text{S}\right.}{8bc^4}$$
$$+\frac{3d^2e\left(-\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)\right)}{2bc^2}$$

```
[In] Integrate[(d + e*x)^3/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b +
ArcSin[c*x]]))/(b*c) + (3*d*e^2*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] -
Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegral[a/b
+ ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4*b*c^3
) + (e^3*(-2*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + CosIntegral[
4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a)/b]*SinIntegral[2*(a/b + A
rcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])]))/(8*b*c^4)
+ (3*d^2*e*(-(CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin[(2*a)/b]) + Cos[(2*a
)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]]))/(2*b*c^2)
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 327, normalized size of antiderivative = 0.83

method	result
derivativedivides	$\frac{8\ \text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^3d^3+8\ \text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+12\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e-12\sin\left(\frac{2a}{b}\right)\text{Ci}(}{}$
default	$\frac{8\ \text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^3d^3+8\ \text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+12\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e-12\sin\left(\frac{2a}{b}\right)\text{Ci}(}{}$

```
[In] int((e*x+d)^3/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/c^4*(8*Si(arcsin(c*x)+a/b)*sin(a/b)*c^3*d^3+8*Ci(arcsin(c*x)+a/b)*cos(a
/b)*c^3*d^3+12*cos(2*a/b)*Si(2*arcsin(c*x)+2*a/b)*c^2*d^2*e-12*sin(2*a/b)*C
i(2*arcsin(c*x)+2*a/b)*c^2*d^2*e+6*Si(arcsin(c*x)+a/b)*sin(a/b)*c*d*e^2+6*C
i(arcsin(c*x)+a/b)*cos(a/b)*c*d*e^2-6*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*c*
d*e^2-6*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*c*d*e^2+2*cos(2*a/b)*Si(2*arcsin
(c*x)+2*a/b)*e^3-2*sin(2*a/b)*Ci(2*arcsin(c*x)+2*a/b)*e^3-cos(4*a/b)*Si(4*a
rcsin(c*x)+4*a/b)*e^3+sin(4*a/b)*Ci(4*arcsin(c*x)+4*a/b)*e^3)/b
```

Fricas [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^3}{b\arcsin(cx)+a}\,dx$$

[In] integrate((e*x+d)^3/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3)/(b*arcsin(c*x) + a), x)

Sympy [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(d+ex)^3}{a+b\,\mathrm{asin}(cx)}\,dx$$

[In] integrate((e*x+d)**3/(a+b*asin(c*x)),x)

[Out] Integral((d + e*x)**3/(a + b*asin(c*x)), x)

Maxima [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^3}{b\arcsin(cx)+a}\,dx$$

[In] integrate((e*x+d)^3/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((e*x + d)^3/(b*arcsin(c*x) + a), x)

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 609, normalized size of antiderivative = 1.55

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = -\frac{3de^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^3\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^4} - \frac{3d^2e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} - \frac{e^3\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^4} - \frac{3de^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{3d^2e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{9de^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{3de^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{2bc^4} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{2bc^4} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^4} + \frac{3de^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{3d^2e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^4} + \frac{3de^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^3\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4} - \frac{e^3\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4}$$

```
[In] integrate((e*x+d)^3/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -3*d*e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^3*cos(a
/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + e^3*cos(a/b)^3*cos_integral(4*a
/b + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 3*d^2*e*cos(a/b)*cos_integral(2*a/b
```

```
+ 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^3*cos(a/b)^4*sin_integral(4*a/b + 4*a
rcsin(c*x))/(b*c^4) - 3*d*e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*ar
csin(c*x))/(b*c^3) + 3*d^2*e*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))
/(b*c^2) + d^3*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) + 9/4*d*e^2*c
os(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 3/4*d*e^2*cos(a/b)*co
s_integral(a/b + arcsin(c*x))/(b*c^3) - 1/2*e^3*cos(a/b)*cos_integral(4*a/b
 + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/2*e^3*cos(a/b)*cos_integral(2*a/b +
2*arcsin(c*x))*sin(a/b)/(b*c^4) + e^3*cos(a/b)^2*sin_integral(4*a/b + 4*arc
sin(c*x))/(b*c^4) + 3/4*d*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/
(b*c^3) - 3/2*d^2*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^2) + 1/2*e^3*c
os(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^4) + 3/4*d*e^2*sin(a/b)*
sin_integral(a/b + arcsin(c*x))/(b*c^3) - 1/8*e^3*sin_integral(4*a/b + 4*ar
csin(c*x))/(b*c^4) - 1/4*e^3*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^4)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx=\int \frac{{\left(d+e\,x\right)}^3}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((d + e*x)^3/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x)^3/(a + b*asin(c*x)), x)
```

3.17 $\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 244

$$\begin{aligned}\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx =\ & \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} \\ & + \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\ & - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\ & - \frac{de\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{bc^2} \\ & + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\ & + \frac{de\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} \\ & - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}\end{aligned}$$

```
[Out] d^2*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+1/4*e^2*Ci(a/b+arcsin(c*x))*cos(a/b)/b
/c^3-1/4*e^2*Ci(3*a/b+3*arcsin(c*x))*cos(3*a/b)/b/c^3+d*e*cos(2*a/b)*Si(2*a
/b+2*arcsin(c*x))/b/c^2+d^2*Si(a/b+arcsin(c*x))*sin(a/b)/b/c+1/4*e^2*Si(a/b
+arcsin(c*x))*sin(a/b)/b/c^3-d*e*Ci(2*a/b+2*arcsin(c*x))*sin(2*a/b)/b/c^2-1
/4*e^2*Si(3*a/b+3*arcsin(c*x))*sin(3*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4831, 6874, 3384, 3380, 3383, 4491}

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{de\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{de\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

```
[In] Int[(d + e*x)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/(b*c) + (e^2*Cos[a/b]*CosInte
gral[a/b + ArcSin[c*x]])/(4*b*c^3) - (e^2*Cos[(3*a)/b]*CosIntegral[(3*a)/b
+ 3*ArcSin[c*x]])/(4*b*c^3) - (d*e*CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin
[(2*a)/b])/(b*c^2) + (d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b*c) +
(e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b*c^3) + (d*e*Cos[(2*a)/b]
*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(b*c^2) - (e^2*Sin[(3*a)/b]*SinInteg
ral[(3*a)/b + 3*ArcSin[c*x]])/(4*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos(x)(cd+e\sin(x))^2}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{c^2d^2\cos(x)}{a+bx}+\frac{e^2\cos(x)\sin^2(x)}{a+bx}+\frac{cde\sin(2x)}{a+bx}\right)dx, x, \arcsin(cx)\right)}{c^3}\\
&= \frac{d^2\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c}+\frac{(de)\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^2}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^3}
\end{aligned}$$

$$= \frac{e^2 \text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right) dx, x, \arcsin(cx)\right)}{c^3} + \frac{\left(d^2 \cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{c} + \frac{\left(de \cos\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{c^2} + \frac{\left(d^2 \sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{c} - \frac{\left(de \sin\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{c^2}$$

$$= \frac{d^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} - \frac{de \, \text{CosIntegral}\left(\frac{2a}{b} + 2\arcsin(cx)\right) \sin\left(\frac{2a}{b}\right)}{bc^2} + \frac{d^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} + \frac{de \cos\left(\frac{2a}{b}\right) \text{Si}\left(\frac{2a}{b} + 2\arcsin(cx)\right)}{bc^2} + \frac{e^2 \text{Subst}\left(\int \frac{\cos(x)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3} - \frac{e^2 \text{Subst}\left(\int \frac{\cos(3x)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3}$$

$$= \frac{d^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} - \frac{de \, \text{CosIntegral}\left(\frac{2a}{b} + 2\arcsin(cx)\right) \sin\left(\frac{2a}{b}\right)}{bc^2} + \frac{d^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{bc} + \frac{de \cos\left(\frac{2a}{b}\right) \text{Si}\left(\frac{2a}{b} + 2\arcsin(cx)\right)}{bc^2} + \frac{\left(e^2 \cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3} - \frac{\left(e^2 \cos\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}+3x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3} + \frac{\left(e^2 \sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3} - \frac{\left(e^2 \sin\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx} dx, x, \arcsin(cx)\right)}{4c^3}$$

$$= \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{de\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{bc^2} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}+\frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} + \frac{de\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2}-\frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \frac{(4c^2d^2+e^2)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)-4cde\,\text{Cos}}{}$$

```
[In] Integrate[(d + e*x)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] ((4*c^2*d^2 + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e^2*Cos[(3*a)/
b]*CosIntegral[3*(a/b + ArcSin[c*x])] - 4*c*d*e*CosIntegral[2*(a/b + ArcSin
[c*x])]*Sin[(2*a)/b] + 4*c^2*d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] +
e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 4*c*d*e*Cos[(2*a)/b]*SinInteg
ral[2*(a/b + ArcSin[c*x])] - e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c
*x])])/(4*b*c^3)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 206, normalized size of antiderivative = 0.84

method	result
derivativedivides	$\frac{4\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)cde-4\,\text{Ci}(2\arcsin(cx)}{}$
default	$\frac{4\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)cde-4\,\text{Ci}(2\arcsin(cx)}{}$

```
[In] int((e*x+d)^2/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/c^3*(4*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d^2+4*Ci(arcsin(c*x)+a/b)*cos(a
/b)*c^2*d^2+4*cos(2*a/b)*Si(2*arcsin(c*x)+2*a/b)*c*d*e-4*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*c*d*e-sin(3*a/b)*Si(3*arcsin(c*x)+3*a/b)*e^2-cos(3*a/b)*Ci
(3*arcsin(c*x)+3*a/b)*e^2+sin(a/b)*Si(arcsin(c*x)+a/b)*e^2+cos(a/b)*Ci(arcs
in(c*x)+a/b)*e^2)/b
```

Fricas [F]

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((e^2*x^2 + 2*d*e*x + d^2)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(d+ex)^2}{a+b\operatorname{asin}(cx)}\,dx$$

```
[In] integrate((e*x+d)**2/(a+b*asin(c*x)),x)
[Out] Integral((d + e*x)**2/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((e*x + d)^2/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.38

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = -\frac{e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{2de\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} - \frac{e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{2de\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{3e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{de\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*cos(a/b)*
cos_integral(a/b + arcsin(c*x))/(b*c) - 2*d*e*cos(a/b)*cos_integral(2*a/b +
 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a
/b + 3*arcsin(c*x))/(b*c^3) + 2*d*e*cos(a/b)^2*sin_integral(2*a/b + 2*arcsi
n(c*x))/(b*c^2) + d^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) + 3/4*
e^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e^2*cos(a/b)
*cos_integral(a/b + arcsin(c*x))/(b*c^3) + 1/4*e^2*sin(a/b)*sin_integral(3*
a/b + 3*arcsin(c*x))/(b*c^3) - d*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c
^2) + 1/4*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(d+e\,x)^2}{a+b\operatorname{asin}(c\,x)}\,dx$$

```
[In] int((d + e*x)^2/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x)^2/(a + b*asin(c*x)), x)
```

3.18 $\int \frac{d+ex}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 115

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

```
[Out] d*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+1/2*e*cos(2*a/b)*Si(2*a/b+2*arcsin(c*x))
/b/c^2+d*Si(a/b+arcsin(c*x))*sin(a/b)/b/c-1/2*e*Ci(2*a/b+2*arcsin(c*x))*sin
(2*a/b)/b/c^2
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4831, 6874, 3384, 3380, 3383, 4491, 12}

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = -\frac{e\sin\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2} + \frac{e\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2} + \frac{d\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

```
[In] Int[(d + e*x)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/(b*c) - (e*CosIntegral[(2*a)/b
+ 2*ArcSin[c*x]]*Sin[(2*a)/b])/(2*b*c^2) + (d*Sin[a/b]*SinIntegral[a/b + Ar
cSin[c*x]])/(b*c) + (e*Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(
2*b*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\cos(x)(cd+e\sin(x))}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^2}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{cd\cos(x)}{a+bx} + \frac{e\cos(x)\sin(x)}{a+bx}\right)\,dx, x, \arcsin(cx)\right)}{c^2}$$

$$= \frac{d\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c} + \frac{e\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c^2}$$

$$= \frac{e\text{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx, x, \arcsin(cx)\right)}{c^2} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c} + \frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{c}$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx, x, \arcsin(cx)\right)}{2c^2}$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{2c^2} - \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \arcsin(cx)\right)}{2c^2}$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.85

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{2cd\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+2cd\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\right.}{2bc^2}$$

[In] Integrate[(d + e*x)/(a + b*ArcSin[c*x]),x]

[Out] (2*c*d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*CosIntegral[2*(a/b + Arc
Sin[c*x])]*Sin[(2*a)/b] + 2*c*d*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + e
*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c^2)

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.90

method	result	siz
derivativedivides	$\frac{\frac{d\left(\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$	10
default	$\frac{\frac{d\left(\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$	10

[In] int((e*x+d)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/c*(d*(Si(arcsin(c*x)+a/b)*sin(a/b)+Ci(arcsin(c*x)+a/b)*cos(a/b))/b+1/2/c*
e*(Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b))/b
)

Fricas [F]

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \int \frac{ex+d}{b\arcsin(cx)+a}\,dx$$

[In] integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((e*x + d)/(b*arcsin(c*x) + a), x)

Sympy [F]

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \int \frac{d+ex}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

```
[In] integrate((e*x+d)/(a+b*asin(c*x)),x)
[Out] Integral((d + e*x)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \int \frac{ex+d}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((e*x + d)/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.21

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

```
[In] integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] d*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) - e*cos(a/b)*cos_integral(
2*a/b + 2*arcsin(c*x))*sin(a/b)/(b*c^2) + e*cos(a/b)^2*sin_integral(2*a/b +
 2*arcsin(c*x))/(b*c^2) + d*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c)
- 1/2*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx=\int \frac{d+e\,x}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((d + e*x)/(a + b*asin(c*x)),x)
[Out] int((d + e*x)/(a + b*asin(c*x)), x)
```

3.19 $\int \frac{1}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 53

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[Out] Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4719, 3384, 3380, 3383}

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[In] Int[(a + b*ArcSin[c*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (Sin[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.83

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(-1),x]
[Out] (Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcSi
n[c*x]])/(b*c)
```

Maple [A] (verified)

Time = 0.01 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91

method	result	size
derivativedivides	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48
default	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48

```
[In] int(1/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

Fricas [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{a+b\operatorname{asin}(cx)}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x)),x)
[Out] Integral(1/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.92

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
+ arcsin(c*x))/(b*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int(1/(a + b*asin(c*x)),x)
[Out] int(1/(a + b*asin(c*x)), x)
```

3.20 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 3.37 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\,(a+b\arcsin{(cx)})}dx$$

```
[In] int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.39

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*e*x + a*d + (b*e*x + b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\operatorname{asin}{(cx)})\,(d+ex)}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\,(d+e\,x)}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x)), x)
```

3.21 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x)^2*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.36 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(ex+d\right)^{2}\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 2.72

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{\left(ex+d\right)^{2}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*e^2*x^2 + 2*a*d*e*x + a*d^2 + (b*e^2*x^2 + 2*b*d*e*x + b*d^2)
*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.78 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))\,(d+ex)^2}\,dx$$

```
[In] integrate(1/(e*x+d)**2/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\,(d+e\,x)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x)^2),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x)^2), x)
```

3.22 $\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 362

$$\begin{aligned}\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = &-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}\\&-\frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}\\&+\frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}\\&+\frac{d^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}\\&+\frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2c^3}\\&-\frac{3e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2c^3}\\&-\frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}\\&+\frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}\\&+\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}\end{aligned}$$

```
[Out] 2*d*e*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b^2/c^2-d^2*cos(a/b)*Si((a+b*arc
sin(c*x))/b)/b^2/c-1/4*e^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c^3+3/4*e^2
*cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+d^2*Ci((a+b*arcsin(c*x))/b)*s
```

```
in(a/b)/b^2/c+1/4*e^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^3+2*d*e*Si(2*(
a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^2-3/4*e^2*Ci(3*(a+b*arcsin(c*x))/b)*si
n(3*a/b)/b^2/c^3-d^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-2*d*e*x*(-c^2
*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-e^2*x^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arc
sin(c*x))
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4829, 4717, 4809, 3384, 3380, 3383, 4727}

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3} - \frac{3e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3} + \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} + \frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(d + e*x)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x*Sqrt[1 - c^
2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b
*ArcSin[c*x])) + (2*d*e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b]
)/(b^2*c^2) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c) + (
e^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3) - (3*e^2*CosIn
tegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (d^2*Cos[a/b]
*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e^2*Cos[a/b]*SinIntegral[(a
 + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (2*d*e*Sin[(2*a)/b]*SinIntegral[(2*(a +
 b*ArcSin[c*x]))/b])/(b^2*c^2) + (3*e^2*Cos[(3*a)/b]*SinIntegral[(3*(a + b*
ArcSin[c*x]))/b])/(4*b^2*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rubi steps

$$\text{integral} = \int \left(\frac{d^2}{(a+b\arcsin(cx))^2} + \frac{2dex}{(a+b\arcsin(cx))^2} + \frac{e^2x^2}{(a+b\arcsin(cx))^2}\right) dx$$

$$= d^2 \int \frac{1}{(a+b\arcsin(cx))^2} dx + (2de) \int \frac{x}{(a+b\arcsin(cx))^2} dx + e^2 \int \frac{x^2}{(a+b\arcsin(cx))^2} dx$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{(cd^2)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))} dx}{b} + \frac{(2de)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{e^2\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^3}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{(3e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(2de\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(2de\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} - \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{d^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2c^3} - \frac{3e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2c^3} - \frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3} + \frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}$$

Mathematica [A] (verified)

Time = 1.63 (sec) , antiderivative size = 290, normalized size of antiderivative = 0.80

$$\int\frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{\frac{4bc^2d^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{8bc^2dex\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{4bc^2e^2x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} - 8cde\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right) - (4c^2d^2}{}$$

```
[In] Integrate[(d + e*x)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*((4*b*c^2*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (8*b*c^2*d*e*x*
Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e^2*x^2*Sqrt[1 - c^2*x^2]
)/(a + b*ArcSin[c*x]) - 8*c*d*e*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*
x])] - (4*c^2*d^2 + e^2)*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] + 3*e^2*Co
sIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4*c^2*d^2*Cos[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] + e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 8*c*
d*e*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 3*e^2*Cos[(3*a)/b]*Si
nIntegral[3*(a/b + ArcSin[c*x])]])/(b^2*c^3)
```

Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 526, normalized size of antiderivative = 1.45

method	result
derivativedivides	$-\frac{4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$
default	$-\frac{4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$

```
[In] int((e*x+d)^2/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^3*(4*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d^2-4*arcsin(c*x
)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d^2-8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a
/b)*sin(2*a/b)*b*c*d*e-8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b*c
*d*e+4*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^2*d^2-4*Ci(arcsin(c*x)+a/b)*sin(a/b
)*a*c^2*d^2+4*(-c^2*x^2+1)^(1/2)*b*c^2*d^2+arcsin(c*x)*Si(arcsin(c*x)+a/b)*
cos(a/b)*b*e^2-arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2-3*arcsin(c*x)
*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*e^2+3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*
a/b)*sin(3*a/b)*b*e^2-8*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a*c*d*e-8*Ci(2*a
rcsin(c*x)+2*a/b)*cos(2*a/b)*a*c*d*e+Si(arcsin(c*x)+a/b)*cos(a/b)*a*e^2-Ci(
arcsin(c*x)+a/b)*sin(a/b)*a*e^2+4*sin(2*arcsin(c*x))*b*c*d*e-3*Si(3*arcsin(
c*x)+3*a/b)*cos(3*a/b)*a*e^2+3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*e^2+(-c
^2*x^2+1)^(1/2)*b*e^2-cos(3*arcsin(c*x))*b*e^2)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(ex+d)^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((e^2*x^2 + 2*d*e*x + d^2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) +
 a^2), x)
```

Sympy [F]

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex)^2}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((e*x+d)**2/(a+b*asin(c*x))**2,x)
[Out] Integral((d + e*x)**2/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((e^2*x^2 + 2*d*e*x + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((3*c^2*e^2*x^3 + 4*c^2
*d*e*x^2 - 2*d*e + (c^2*d^2 - 2*e^2)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c
^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1276 vs. $2(348) = 696$.

Time = 0.38 (sec) , antiderivative size = 1276, normalized size of antiderivative = 3.52

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] 4*b*c*d*e*arcsin(c*x)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) - 3*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral(3
*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*c^2*d^
2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 3*b*e^2*arcsin(c*x)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsi
n(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*c*d*e*arcsin(c*x)*cos(a/b)*
sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c
^3) - b*c^2*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)^2*cos_integral(2*a/b + 2*a
rcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*e^2*cos(a/b)^2*cos_inte
```

```
gral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*
c^2*d^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b
^2*c^3) + 3*a*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)*sin(a/b)*sin_integral(2*a/b +
2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*c^2*d^2*cos(a/b)*sin_i
ntegral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*sqrt(-c^2*
x^2 + 1)*b*c^2*d*e*x/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*c*d*e*arcsin(c
*x)*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) +
 3/4*b*e^2*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^
3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*e^2*arcsin(c*x)*cos_integral(a/b + arcsi
n(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*b*e^2*arcsin(c*x)*
cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c
^3) - 1/4*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*b*c^2*d^2/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) - 2*a*c*d*e*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + 3/4*a*e^2*cos_integral(3*a/b + 3*arcsin(c*x))*si
n(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*a*e^2*cos_integral(a/b + arc
sin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*a*e^2*cos(a/b)*s
in_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/4*
a*e^2*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) + (-c^2*x^2 + 1)^(3/2)*b*e^2/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt
(-c^2*x^2 + 1)*b*e^2/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx=\int \frac{{\left(d+e\,x\right)}^2}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((d + e*x)^2/(a + b*asin(c*x))^2,x)
[Out] int((d + e*x)^2/(a + b*asin(c*x))^2, x)
```

3.23 $\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 181

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}+\frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{d\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}-\frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}+\frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}$$

```
[Out] e*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b^2/c^2-d*cos(a/b)*Si((a+b*arcsin(c*
x))/b)/b^2/c+d*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c+e*Si(2*(a+b*arcsin(c*
x))/b)*sin(2*a/b)/b^2/c^2-d*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-e*x*(-
c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used

= {4829, 4717, 4809, 3384, 3380, 3383, 4727}

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \frac{e\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{e\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(d + e*x)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x*Sqrt[1 - c^2*x^2]
)/(b*c*(a + b*ArcSin[c*x])) + (e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[
c*x]))/b])/(b^2*c^2) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2
*c) - (d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) + (e*Sin[(2*a
)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b^2*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
```

```
b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d}{(a+b\arcsin(cx))^2}+\frac{ex}{(a+b\arcsin(cx))^2}\right)dx\\
&= d\int \frac{1}{(a+b\arcsin(cx))^2}\,dx+e\int \frac{x}{(a+b\arcsin(cx))^2}\,dx\\
&= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{(cd)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx}{b}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\
&= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}\\
&\quad+\frac{d\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c}\\
&\quad+\frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\
&\quad+\frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}
\end{aligned}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} - \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2} + \frac{d\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} + \frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}$$

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.82

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{bc(d+ex)\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + e\log(a+b\arcsin(cx)) + cd\left(\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{arcs}\right.\right.}{}$$

```
[In] Integrate[(d + e*x)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-((b*c*(d + e*x)*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + e*Log[a + b*Arc
Sin[c*x]] + c*d*(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - Cos[a/b]*SinInte
gral[a/b + ArcSin[c*x]]) + e*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x]
)] - Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x]
)]))/(b^2*c^2)
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.42

method	result
derivativedivides	$-\frac{d\left(\arcsin(cx)\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\right.}{(a+b\arcsin(cx))b^2}$
default	$-\frac{d\left(\arcsin(cx)\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\right.}{(a+b\arcsin(cx))b^2}$

```
[In] int((e*x+d)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b-arcsin(c*x)*Ci(arcsin(c
*x)+a/b)*sin(a/b)*b+Si(arcsin(c*x)+a/b)*cos(a/b)*a-Ci(arcsin(c*x)+a/b)*sin(
a/b)*a+(-c^2*x^2+1)^(1/2)*b)/(a+b*arcsin(c*x))/b^2+1/2/c*e*(2*arcsin(c*x)*S
i(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*c
os(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+2*Ci(2*arcsin(c*x)+2*a/b
)*cos(2*a/b)*a-sin(2*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2)
```

Fricas [F]

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx=\int \frac{ex+d}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate((e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((e*x + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx=\int \frac{d+ex}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate((e*x+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((d + e*x)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \int \frac{ex+d}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate((e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d) - (b^2*c*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) + a*b*c)*integrate((2*c^2*e*x^2 + c^2*d*x - e)*sqrt(c*x +
 1)*sqrt(-c*x + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. 2(177) = 354.

Time = 0.36 (sec) , antiderivative size = 554, normalized size of antiderivative = 3.06

$$\begin{aligned}\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx =& \frac{2\,be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &+ \frac{bcd\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &+ \frac{2\,be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &- \frac{bcd\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &+ \frac{2\,ae\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &+ \frac{acd\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &+ \frac{2\,ae\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &- \frac{acd\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} - \frac{\sqrt{-c^2x^2+1}bcex}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &- \frac{be\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} \\ &- \frac{\sqrt{-c^2x^2+1}bcd}{b^3c^2\arcsin\left(cx\right)+ab^2c^2} - \frac{ae\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^3c^2\arcsin\left(cx\right)+ab^2c^2}\end{aligned}$$

```
[In] integrate((e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 2*b*e*arcsin(c*x)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*a
rcsin(c*x) + a*b^2*c^2) + b*c*d*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))
*sin(a/b)/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 2*b*e*arcsin(c*x)*cos(a/b)*si
n(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2
) - b*c*d*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 2*a*e*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x)
)/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + a*c*d*cos_integral(a/b + arcsin(c*x))
*sin(a/b)/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 2*a*e*cos(a/b)*sin(a/b)*sin_i
ntegral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - a*c*d*co
s(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
sqrt(-c^2*x^2 + 1)*b*c*e*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - b*e*arcsin(c
*x)*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
 sqrt(-c^2*x^2 + 1)*b*c*d/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - a*e*cos_integ
ral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \int \frac{d+e\,x}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((d + e*x)/(a + b*asin(c*x))^2,x)
[Out] int((d + e*x)/(a + b*asin(c*x))^2, x)
```

3.24 $\int \frac{1}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}+\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

```
[Out] -cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^
2/c-(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4717, 4809, 3384, 3380, 3383}

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(a + b*ArcSin[c*x])^(-2),x]
```

```
[Out] -(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(a + b*ArcSin
[c*x])/b]*Sin[a/b])/(b^2*c) - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])
/(b^2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{c\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx}{b}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{\cos\left(\frac{a}{b}\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{\sin\left(\frac{a}{b}\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.84

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{b\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^2c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(-2),x]
[Out] (-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c*
x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Maple [A] (verified)

Time = 0.01 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.88

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b} - \frac{\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right) - \text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76
default	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b} - \frac{\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right) - \text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76

```
[In] int(1/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
[Out] 1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b-(Si(arcsin(c*x)+a/b)*cos(a/b)-
Ci(arcsin(c*x)+a/b)*sin(a/b))/b^2)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**(-2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)*integrate(s
qrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))
/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 192 vs. 2(84) = 168.

Time = 0.31 (sec) , antiderivative size = 192, normalized size of antiderivative = 2.23

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{b\arcsin(cx)\,\mathrm{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} + \frac{a\,\mathrm{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{a\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{\sqrt{-c^2x^2+1}\,b}{b^3c\arcsin(cx)+ab^2c}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) +
 a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

```
[In] int(1/(a + b*asin(c*x))^2,x)
[Out] int(1/(a + b*asin(c*x))^2, x)
```

3.25 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \operatorname{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 10.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 5.66 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\left(a+b\arcsin\left(cx\right)\right)^{2}}dx$$

```
[In] int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 51, normalized size of antiderivative = 2.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin\left(cx\right)+a)^2}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*e*x + a^2*d + (b^2*e*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*e*x
+ a*b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.67 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex)}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x)), x)
```

Maxima [N/A]

Not integrable

Time = 1.60 (sec) , antiderivative size = 297, normalized size of antiderivative = 16.50

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin\,(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c*e*x + a*b*c*d + (b^2*c*e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)))*integrate((c^2*d*x + e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^
3*e^2*x^4 + 2*a*b*c^3*d*e*x^3 - 2*a*b*c*d*e*x - a*b*c*d^2 + (a*b*c^3*d^2 -
a*b*c*e^2)*x^2 + (b^2*c^3*e^2*x^4 + 2*b^2*c^3*d*e*x^3 - 2*b^2*c*d*e*x - b^2
*c*d^2 + (b^2*c^3*d^2 - b^2*c*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e*x + a*b*c*d + (b^2*c*
e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin\,(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d+e\,x\right)} \,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x)), x)
```

3.26 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \mathrm{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 12.80 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.96 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(ex+d\right)^{2}\left(a+b\arcsin\left(cx\right)\right)^{2}}dx$$

```
[In] int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 92, normalized size of antiderivative = 5.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(ex+d\right)^{2}\left(b\arcsin\left(cx\right)+a\right)^{2}}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*e^2*x^2 + 2*a^2*d*e*x + a^2*d^2 + (b^2*e^2*x^2 + 2*b^2*d*e*
x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^2 + 2*a*b*d*e*x + a*b*d^2)*arcsin
(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 6.16 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.06

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex)^2}\,dx$$

```
[In] integrate(1/(e*x+d)**2/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 2.60 (sec) , antiderivative size = 426, normalized size of antiderivative = 23.67

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c*e^2*x^2 + 2*a*b*c*d*e*x + a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*e
*x + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((c^2*
e*x^2 - c^2*d*x - 2*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*e^3*x^5 + 3*a*
b*c^3*d*e^2*x^4 - 3*a*b*c*d^2*e*x - a*b*c*d^3 + (3*a*b*c^3*d^2*e - a*b*c*e^
3)*x^3 + (a*b*c^3*d^3 - 3*a*b*c*d*e^2)*x^2 + (b^2*c^3*e^3*x^5 + 3*b^2*c^3*d
*e^2*x^4 - 3*b^2*c*d^2*e*x - b^2*c*d^3 + (3*b^2*c^3*d^2*e - b^2*c*e^3)*x^3
+ (b^2*c^3*d^3 - 3*b^2*c*d*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e^2*x^2 + 2*a*b*c*d*e*x +
a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*e*x + b^2*c*d^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.97 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(d+e\,x\right)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x)^2),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x)^2), x)
```

3.27 $\int (d+ex)^m(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \frac{(d+ex)^{1+m}(a+b\arcsin(cx))^2}{e(1+m)} - \frac{2bc\text{Int}\left(\frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}},x\right)}{e(1+m)}$$

```
[Out] (e*x+d)^(1+m)*(a+b*arcsin(c*x))^2/e/(1+m)-2*b*c*Unintegrable((e*x+d)^(1+m)*
(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)/e/(1+m)
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (d+ex)^m(a+b\arcsin(cx))^2\,dx$$

```
[In] Int[(d + e*x)^m*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((d + e*x)^(1 + m)*(a + b*ArcSin[c*x])^2)/(e*(1 + m)) - (2*b*c*Defer[Int][(
(d + e*x)^(1 + m)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2], x])/(e*(1 + m))
```

Rubi steps

$$\text{integral} = \frac{(d+ex)^{1+m}(a+b\arcsin(cx))^2}{e(1+m)} - \frac{(2bc)\int \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{e(1+m)}$$

Mathematica [N/A]

Not integrable

Time = 11.40 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx=\int (d+ex)^m(a+b\arcsin(cx))^2\,dx$$

```
[In] Integrate[(d + e*x)^m*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(d + e*x)^m*(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.24 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int (ex+d)^m\,(a+b\arcsin\,(cx))^2\,dx$$

```
[In] int((e*x+d)^m*(a+b*arcsin(c*x))^2,x)
[Out] int((e*x+d)^m*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.78

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx=\int (b\arcsin\,(cx)+a)^2(ex+d)^m\,dx$$

```
[In] integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*(e*x + d)^m, x)
```

Sympy [N/A]

Not integrable

Time = 14.92 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}\,(cx))^2\,(d+ex)^m\,dx$$

```
[In] integrate((e*x+d)**m*(a+b*asin(c*x))**2,x)
[Out] Integral((a + b*asin(c*x))**2*(d + e*x)**m, x)
```

Maxima [N/A]

Not integrable

Time = 1.68 (sec) , antiderivative size = 227, normalized size of antiderivative = 12.61

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (b\arcsin{(cx)}+a)^2(ex+d)^m\,dx$$

```
[In] integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (e*x + d)^(m + 1)*a^2/(e*(m + 1)) + ((b^2*e*x + b^2*d)*(e*x + d)^m*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (e*m + e)*integrate(2*((b^2*c*e*x +
b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) - (a*b*e*m + a*b*e - (a*b*c^2*e*m + a*b*c^2*e)*x^2)*(e*x
+ d)^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2*e*m + c^2*e)*x^2 -
 e*m - e), x))/(e*m + e)
```

Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (b\arcsin{(cx)}+a)^2(ex+d)^m\,dx$$

```
[In] integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*(e*x + d)^m, x)
```

Mupad [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d+e\,x\right)}^m \,d x$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x)^m,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x)^m, x)
```

3.28 $\int (d+ex)^m(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 154

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = -\frac{bc(d+ex)^{2+m}\sqrt{1-\frac{c(d+ex)}{cd-e}}\sqrt{1-\frac{c(d+ex)}{cd+e}}\operatorname{AppellF1}\left(2+m,\frac{1}{2},\frac{1}{2},3+m,\frac{c(d+ex)}{cd-e},\frac{c(d+ex)}{cd+e}\right)}{e^2(1+m)(2+m)\sqrt{1-c^2x^2}} + \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{e(1+m)}$$

```
[Out] (e*x+d)^(1+m)*(a+b*arcsin(c*x))/e/(1+m)-b*c*(e*x+d)^(2+m)*AppellF1(2+m,1/2,
1/2,3+m,c*(e*x+d)/(c*d-e),c*(e*x+d)/(c*d+e))*(1-c*(e*x+d)/(c*d-e))^(1/2)*(1
-c*(e*x+d)/(c*d+e))^(1/2)/e^2/(1+m)/(2+m)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4827, 774, 138}

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{e(m+1)} - \frac{bc\sqrt{1-\frac{c(d+ex)}{cd-e}}\sqrt{1-\frac{c(d+ex)}{cd+e}}(d+ex)^{m+2}\operatorname{AppellF1}\left(m+2,\frac{1}{2},\frac{1}{2},m+3,\frac{c(d+ex)}{cd-e},\frac{c(d+ex)}{cd+e}\right)}{e^2(m+1)(m+2)\sqrt{1-c^2x^2}}$$

```
[In] Int[(d + e*x)^m*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*(d + e*x)^(2 + m)*Sqrt[1 - (c*(d + e*x))/(c*d - e)]*Sqrt[1 - (c*(d +
 e*x))/(c*d + e)]*AppellF1[2 + m, 1/2, 1/2, 3 + m, (c*(d + e*x))/(c*d - e),
 (c*(d + e*x))/(c*d + e)])/(e^2*(1 + m)*(2 + m)*Sqrt[1 - c^2*x^2])) + ((d +
 e*x)^(1 + m)*(a + b*ArcSin[c*x]))/(e*(1 + m))
```

Rule 138

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[c^n*e^p*((b*x)^(m + 1)/(b*(m + 1)))*AppellF1[m + 1, -n, -p,
 m + 2, (-d)*(x/c), (-f)*(x/e)], x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 774

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[(-a)*c, 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + e*(q/c)))^p*
(1 - (d + e*x)/(d - e*(q/c)))^p), Subst[Int[x^m*Simp[1 - x/(d + e*(q/c)), x
]^p*Simp[1 - x/(d - e*(q/c)), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{e(1+m)} - \frac{(bc)\int \frac{(d+ex)^{1+m}}{\sqrt{1-c^2x^2}}\,dx}{e(1+m)}$$

$$= \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{e(1+m)} - \frac{\left(bc\sqrt{1-\frac{d+ex}{d-\frac{e}{c}}}\sqrt{1-\frac{d+ex}{d+\frac{e}{c}}}\right)\text{Subst}\left(\int \frac{x^{1+m}}{\sqrt{1-\frac{cx}{cd-e}}\sqrt{1-\frac{cx}{cd+e}}}\,dx, x, d+ex\right)}{e^2(1+m)\sqrt{1-c^2x^2}}$$

$$= -\frac{bc(d+ex)^{2+m}\sqrt{1-\frac{c(d+ex)}{cd-e}}\sqrt{1-\frac{c(d+ex)}{cd+e}}\,\text{AppellF1}\left(2+m,\frac{1}{2},\frac{1}{2},3+m,\frac{c(d+ex)}{cd-e},\frac{c(d+ex)}{cd+e}\right)}{e^2(1+m)(2+m)\sqrt{1-c^2x^2}} + \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{e(1+m)}$$

Mathematica [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (d+ex)^m(a+b\arcsin(cx))\,dx$$

```
[In] Integrate[(d + e*x)^m*(a + b*ArcSin[c*x]),x]
[Out] Integrate[(d + e*x)^m*(a + b*ArcSin[c*x]), x]
```

Maple [F]

$$\int (ex+d)^m\,(a+b\arcsin(cx))\,dx$$

```
[In] int((e*x+d)^m*(a+b*arcsin(c*x)),x)
[Out] int((e*x+d)^m*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin(cx)+a)(ex+d)^m\,dx$$

```
[In] integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)*(e*x + d)^m, x)
```

Sympy [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (a+b\operatorname{asin}(cx))\,(d+ex)^m\,dx$$

```
[In] integrate((e*x+d)**m*(a+b*asin(c*x)),x)
[Out] Integral((a + b*asin(c*x))*(d + e*x)**m, x)
```

Maxima [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin{(cx)}+a)(ex+d)^m\,dx$$

[In] integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] ((e*x + d)*(e*x + d)^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (e*m + e)*integrate((c*e*x + c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m/((c^2*e *m + c^2*e)*x^2 - e*m - e), x))*b/(e*m + e) + (e*x + d)^(m + 1)*a/(e*(m + 1))

Giac [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin{(cx)}+a)(ex+d)^m\,dx$$

[In] integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)*(e*x + d)^m, x)

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^m\,dx$$

[In] int((a + b*asin(c*x))*(d + e*x)^m,x)

[Out] int((a + b*asin(c*x))*(d + e*x)^m, x)

3.29 $\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\text{Int}\left(\frac{(d+ex)^m}{a+b\arcsin(cx)},x\right)$$

```
[Out] Unintegrable((e*x+d)^m/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$$

```
[In] Int[(d + e*x)^m/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(d + e*x)^m/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral}=\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$$

```
[In] Integrate[(d + e*x)^m/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(d + e*x)^m/(a + b*ArcSin[c*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.32 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{(ex+d)^m}{a+b\arcsin(cx)}dx$$

```
[In] int((e*x+d)^m/(a+b*arcsin(c*x)),x)
[Out] int((e*x+d)^m/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(ex+d)^m}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 0.95 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(d+ex)^m}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate((e*x+d)**m/(a+b*asin(c*x)),x)
[Out] Integral((d + e*x)**m/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^m}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

Giac [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^m}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx = \int \frac{(d+e\,x)^m}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((d + e*x)^m/(a + b*asin(c*x)),x)
[Out] int((d + e*x)^m/(a + b*asin(c*x)), x)
```

3.30 $\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \operatorname{Int}\left(\frac{(d+ex)^m}{(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(d + e*x)^m/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][(d + e*x)^m/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.73 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(d + e*x)^m/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(d + e*x)^m/(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.45 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{(ex+d)^m}{(a+b\arcsin(cx))^2}dx$$

```
[In] int((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
[Out] int((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.89

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(ex+d)^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((e*x + d)^m/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [N/A]

Not integrable

Time = 15.55 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(d+ex)^m}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((e*x+d)**m/(a+b*asin(c*x))**2,x)
[Out] Integral((d + e*x)**m/(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 1.79 (sec) , antiderivative size = 237, normalized size of antiderivative = 13.17

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^m}{(b\arcsin{(cx)}+a)^2}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m - (b^2*c*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((c^2*d*x + (c^2*e*m + c^2*e)*x^2 - e
*m)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m/(a*b*c^3*e*x^3 + a*b*c^3*d*x^2
 - a*b*c*e*x - a*b*c*d + (b^2*c^3*e*x^3 + b^2*c^3*d*x^2 - b^2*c*e*x - b^2*c
*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^m}{(b\arcsin{(cx)}+a)^2}\,dx$$

```
[In] integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^m/(b*arcsin(c*x) + a)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+e\,x)^m}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((d + e*x)^m/(a + b*asin(c*x))^2,x)
```

```
[Out] int((d + e*x)^m/(a + b*asin(c*x))^2, x)
```

3.31 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 669

$$\begin{aligned}\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx &= \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}}+\frac{2bg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}\\
&-\frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}\\
&-\frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bg^3x^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}\\
&-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{bcg^3x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}\\
&+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}\\
&+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2}\\
&-\frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4}\\
&+\frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4}\\
&+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}\\
&+\frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 1/2*f^3*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/8*f*g^2*x*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/c^2+3/4*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)
^(1/2)-f^2*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2-1/3*g^
3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/5*g^3*(-c^2*x^2
+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+b*f^2*g*x*(-c^2*d*x^2+d)^(
1/2)/c/(-c^2*x^2+1)^(1/2)+2/15*b*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1
)^(1/2)-1/4*b*c*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16*b*f*g^
2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/3*b*c*f^2*g*x^3*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/45*b*g^3*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*
x^2+1)^(1/2)-3/16*b*c*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2
5*b*c*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f^3*(a+b*arcsin(c
*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+3/16*f*g^2*(a+b*arcsin(c
*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 669, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.387$, Rules

used = {4861, 4847, 4741, 4737, 30, 4767, 4783, 4795, 272, 45, 4779, 12}

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2} - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} - \frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4} + \frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}} - \frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{3bfg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}} - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{bcg^3x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{bg^3x^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}} + \frac{2bg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*f^2*g*x*Sqrt[d - c^2*d*x^2])/(c*Sqrt[1 - c^2*x^2]) + (2*b*g^3*x*Sqrt[d -
 c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) - (b*c*f^3*x^2*Sqrt[d - c^2*d*x^2])
/(4*Sqrt[1 - c^2*x^2]) + (3*b*f*g^2*x^2*Sqrt[d - c^2*d*x^2])/(16*c*Sqrt[1 -
 c^2*x^2]) - (b*c*f^2*g*x^3*Sqrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) + (b
*g^3*x^3*Sqrt[d - c^2*d*x^2])/(45*c*Sqrt[1 - c^2*x^2]) - (3*b*c*f*g^2*x^4*S
qrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (b*c*g^3*x^5*Sqrt[d - c^2*d*x^
2])/(25*Sqrt[1 - c^2*x^2]) + (f^3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/2 - (3*f*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c^2) + (3*f*g^
2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 - (f^2*g*(1 - c^2*x^2)*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/c^2 - (g^3*(1 - c^2*x^2)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^4) + (g^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]))/(5*c^4) + (f^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2]) + (3*f*g^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}\int \left(f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))+3f^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))+3fg^2x^2\sqrt{1-\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f^3\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3f^2g\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(g^3\sqrt{d-c^2dx^2}\right)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2} - \frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4} + \frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} + \frac{\left(f^3\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcf^3\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(bf^2g\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)\,dx}{c\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(3bcfg^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcg^3\sqrt{d-c^2dx^2}\right)\int \frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a \\
&\quad + b\arcsin(cx)) - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2} \\
&\quad - \frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4} + \frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&\quad + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3bfg^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{8c\sqrt{1-c^2x^2}} - \frac{\left(bg^3\sqrt{d-c^2dx^2}\right)\int \left(-2-c^2x^2+3c^4x^4\right)\,dx}{15c^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}} + \frac{2bg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} \\
&\quad + \frac{3bfg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}} - \frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bg^3x^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{bcg^3x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a \\
&\quad + b\arcsin(cx)) - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2} \\
&\quad - \frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4} + \frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&\quad + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 356, normalized size of antiderivative = 0.53

$$
\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx
$$

$$
= \frac{\sqrt{d-c^2dx^2}\left(225a^2(4c^3f^3+3cfg^2)+30ab\sqrt{1-c^2x^2}(-16g^3-c^2g(120f^2+45fgx+8g^2x^2)+6c^4x(10f^3\right.}{}
$$

```
[In] Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(225*a^2*(4*c^3*f^3 + 3*c*f*g^2) + 30*a*b*Sqrt[1 - c^2
*x^2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^3 +
```

```
 20*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)) + b^2*c*x*(480*g^3 + 5*c^2*g*(720*
f^2 + 135*f*g*x + 16*g^2*x^2) - 3*c^4*x*(300*f^3 + 400*f^2*g*x + 225*f*g^2*
x^2 + 48*g^3*x^3)) + 30*b*(15*a*(4*c^3*f^3 + 3*c*f*g^2) + b*Sqrt[1 - c^2*x^
2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^3 + 20
*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)))*ArcSin[c*x] + 225*b^2*c*f*(4*c^2*f^2
 + 3*g^2)*ArcSin[c*x]^2))/(3600*b*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.62 (sec) , antiderivative size = 1396, normalized size of antiderivative = 2.09

method	result	size
default	Expression too large to display	1396
parts	Expression too large to display	1396

```
[In] int((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c
^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^2
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c
^2*d*x^2+d)^(1/2))))-f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b*(-1/16*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(4*c^2*f^2+3
*g^2)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)
^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^
(1/2)*x*c-1)*g^3*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(
1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*
c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(4*arcsin(c*x)+I)/c^3/(c^2
*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2
*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(12*I*f^2*c^2+36*arcsin(c*x)*
c^2*f^2+I*g^2+3*arcsin(c*x)*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2
)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^
3*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g*(6*I*f^2*c^2+6*arcsin(c*x)*c^2*f^2+I*g^2+arcsin(c
*x)*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
x*c+c^2*x^2-1)*g*(6*arcsin(c*x)*c^2*f^2-6*I*f^2*c^2+arcsin(c*x)*g^2-I*g^2)/
c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2
+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^3*(-I+2*arcsin(c*x))/c/(c^2*x^2-1)
+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I
*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(36*arcsin(c*x)*c^2*f^2-12*I*f^2*c^2
+3*arcsin(c*x)*g^2-I*g^2)/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(8*I
*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3
```

```
*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(-I+4*arcsin(c*x))/c^3/(c^2*x^2-1)+1
/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^6-20*
I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x
^2-1)*g^3*(-I+5*arcsin(c*x))/c^4/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin{(cx)}+a)\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3*
b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3\,dx$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**3, x)
```

Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin{(cx)}+a)\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^3 - 1/15*a*g^3*(3*
(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)) + 3/
8*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d)
+ sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a*f^2*g/(c^2*d) + sqrt(
d)*integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*sqrt(c*x + 1
)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.32 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 450

$$\begin{aligned}
&\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx\\
&=\frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}\\
&\quad-\frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&\quad-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&\quad-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}\\
&\quad+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 1/2*f^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/8*g^2*x*(a+b*arcsin(c*x)
)*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)-2/3*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/3*b*f*
g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/4*b*c*f^2*x^2*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)-2/9*b*c*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c*g
^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f^2*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+1/16*g^2*(a+b*arcsin(c*x))^2*(-
c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 450, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.258, Rules used = {4861, 4847, 4741, 4737, 30, 4767, 4783, 4795}

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$
$$-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}$$
$$-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}-\frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}$$
$$-\frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*f*g*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*f^2*x^2*Sqrt
[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (b*g^2*x^2*Sqrt[d - c^2*d*x^2])/(1
6*c*Sqrt[1 - c^2*x^2]) - (2*b*c*f*g*x^3*Sqrt[d - c^2*d*x^2])/(9*Sqrt[1 - c^
2*x^2]) - (b*c*g^2*x^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (f^2*x
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - (g^2*x*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x]))/(8*c^2) + (g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/4 - (2*f*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^
2) + (f^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^
2]) + (g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^
2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}\int \left(f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))+2fgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))+g^2x^2\sqrt{1-c^2x}\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f^2\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2fg\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2} + \frac{\left(f^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcf^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(2bfg\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)\,dx}{3c\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcg^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{4\sqrt{1-c^2x^2}}$$

$$= \frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2} + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(bg^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{8c\sqrt{1-c^2x^2}}$$

$$= \frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{bg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}} - \frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2} + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.53

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d-c^2dx^2}\left(-36bcf^2x^2-9bcg^2x^4-\frac{32bfgx(-3+c^2x^2)}{c}+72f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+36g^2x^3\sqrt{1-\right.}{}$$

```
[In] Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-36*b*c*f^2*x^2 - 9*b*c*g^2*x^4 - (32*b*f*g*x*(-3 + c
^2*x^2))/c + 72*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 36*g^2*x^3*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (96*f*g*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/c^2 + (36*f^2*(a + b*ArcSin[c*x])^2)/(b*c) + (9*g^2*(b*c^2*x^2
- 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + (a + b*ArcSin[c*x])^2/b))/c
^3))/(144*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 973, normalized size of antiderivative = 2.16

method	result
default	$a\left(f^{2}\left(\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}\right)+g^{2}\left(-\frac{x\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{4c^{2}d}+\frac{\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}}{4c^{2}}\right)\right.$
parts	$a\left(f^{2}\left(\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}\right)+g^{2}\left(-\frac{x\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{4c^{2}d}+\frac{\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}}{4c^{2}}\right)\right.$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^2*(1
/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*
d*x^2+d)^(1/2))))-2/3*f*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b*(-1/16*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(4*c^2*f^2+g^2)
+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2*(4*
arcsin(c*x)+I)/c^3/(c^2*x^2-1)+1/36*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2
*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(I+3*
arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(I+2*arcsin(c*x))/
c/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-
1)*f*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/16*(-d*(c
^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(
1/2)-2*c*x)*f^2*(-I+2*arcsin(c*x))/c/(c^2*x^2-1)+1/36*(-d*(c^2*x^2-1))^(1/2
)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^
2*x^2+1)*f*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2
)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-
12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2*(-I+4*arcsin(c*x))/c^3/(c^2*x^2-
1))
```

Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2 +
 2*b*f*g*x + b*f^2)*arcsin(c*x)), x)
```

Sympy [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^2\,dx$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**2, x)
```

Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^2 + 1/8*a*g^2*(sqr
t(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*arcs
in(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*f*g/(c^2*d) + sqrt(d)*integrate
((b*g^2*x^2 + 2*b*f*g*x + b*f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int (f+g\,x)^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.33 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 238

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{bgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{bcgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/3*g*(-c^2*x^2+1)*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/3*b*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^
2+1)^(1/2)-1/4*b*c*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c*g*
x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f*(a+b*arcsin(c*x))^2*(-c^2
*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used

$= \{4861, 4847, 4741, 4737, 30, 4767\}$

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2} - \frac{bcfx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{bgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}} - \frac{bcgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*g*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*f*x^2*Sqrt[d - c
^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) - (b*c*g*x^3*Sqrt[d - c^2*d*x^2])/(9*Sqrt[
1 - c^2*x^2]) + (f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - (g*(1 - c
^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^2) + (f*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{d-c^2dx^2}\int (f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(f\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(g\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}\\
&\quad+\frac{\left(f\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bcf\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(bg\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)\,dx}{3c\sqrt{1-c^2x^2}}\\
&= \frac{bgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{bcgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a\\
&\quad+b\arcsin(cx))\\
&\quad-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.55

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(-9bcfx^2-\frac{4bgx(-3+c^2x^2)}{c}+18fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{12g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{c^2}+\frac{9f(\cdots}{\cdots}\right.}{36\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-9*b*c*f*x^2 - (4*b*g*x*(-3 + c^2*x^2))/c + 18*f*x*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (12*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x]))/c^2 + (9*f*(a + b*ArcSin[c*x])^2)/(b*c)))/(36*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 628, normalized size of antiderivative = 2.64

method	result
default	$\frac{afx\sqrt{-c^2dx^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^2f}{4c(c^2x^2-1)}+\frac{\sqrt{-d(c\cdots}}{\cdots}\right.$
parts	$\frac{afx\sqrt{-c^2dx^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^2f}{4c(c^2x^2-1)}+\frac{\sqrt{-d(c\cdots}}{\cdots}\right.$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))-1/3*a*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+b*(-1/4*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-d*(
c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*
x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/
2)-2*c*x)*f*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2
*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/8*(-d*
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)/c
^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+
2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))/c/(c^2*x^2-1)+1/
72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="fric
as")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x)), x)
```

Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))(f+gx)\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="maxi
ma")
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f + sqrt(d)*integrat
e((b*g*x + b*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)), x) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a*g/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="giac
")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.34 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 736

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx \\
&= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{a\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] a*(-c^2*d*x^2+d)^(1/2)/g+b*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g-b*c*x*(-c^2*d
*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/2*c*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+
```

```
d)^(1/2)/b/g/(-c^2*x^2+1)^(1/2)-1/2*(1-c^2*f^2/g^2)*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)-a*arctan((c^2*f*x+g)/(c^2*
f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)
/g^2/(-c^2*x^2+1)^(1/2)+I*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g
/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-
c^2*x^2+1)^(1/2)-I*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(
c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2
+1)^(1/2)+b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/
2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-b*poly
log(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^
2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+1/2*(a+b*arcsin(c*x))^
2*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/(g*x+f)
```

Rubi [A] (verified)

Time = 1.29 (sec) , antiderivative size = 736, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.613, Rules used = {4861, 4849, 697, 4841, 6874, 739, 210, 1668, 12, 4883, 4881, 4767, 8, 4857, 3404, 2296, 2221, 2317, 2438}

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx \\
&= -\frac{\sqrt{d-c^2dx^2}\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{2bc\sqrt{1-c^2x^2}(f+gx)}+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&+\frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}}-\frac{a\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}\arctan\left(\frac{c^2fx+g}{\sqrt{1-c^2x^2}\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&+\frac{a\sqrt{d-c^2dx^2}}{g}+\frac{b\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&-\frac{b\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&+\frac{ib\arcsin(cx)\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&-\frac{ib\arcsin(cx)\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g^2\sqrt{1-c^2x^2}} \\
&+\frac{b\arcsin(cx)\sqrt{d-c^2dx^2}}{g}-\frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] (a*Sqrt[d - c^2*d*x^2])/g - (b*c*x*Sqrt[d - c^2*d*x^2])/(g*Sqrt[1 - c^2*x^2
]) + (b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/g + (c*x*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/(2*b*g*Sqrt[1 - c^2*x^2]) - ((1 - (c^2*f^2)/g^2)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*x)*Sqrt[1 - c^2*x^2]) + (S
qrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*x
)) - (a*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqrt[
c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/(g^2*Sqrt[1 - c^2*x^2]) + (I*b*Sqrt[c^2
*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)
/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - (I*b*Sqrt[c^2*f^2
- g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) + (b*Sqrt[c^2*f^2 - g^2]*
Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
- g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - (b*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x
^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^2*S
qrt[1 - c^2*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
```

```
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\sqrt{d-c^2dx^2}\int \frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^2}{(f+gx)^2}\,dx}{2bc\sqrt{1-c^2x^2}}$$

$$= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} + \frac{\sqrt{d-c^2dx^2}\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} + \frac{\sqrt{d-c^2dx^2}\int \left(-\frac{a(c^2f^2-g^2+c^2fgx+c^2g^2x^2)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{b(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{\left(a\sqrt{d-c^2dx^2}\right)\int \frac{c^2f^2-g^2+c^2fgx+c^2g^2x^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&= \frac{a\sqrt{d-c^2dx^2}}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(a\sqrt{d-c^2dx^2}\right)\int \frac{c^2g^2(c^2f^2-g^2)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{c^2g^4\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \left(\frac{c^2gx\arcsin(cx)}{\sqrt{1-c^2x^2}} + \frac{(c^2f^2-g^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}} \\
&= \frac{a\sqrt{d-c^2dx^2}}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(bc^2\sqrt{d-c^2dx^2}\right)\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int \frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int \frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a\sqrt{d-c^2dx^2}}{g} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int 1\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{1}{-c^2f^2+g^2-x^2}\,dx, x, \frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{x}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&- \frac{a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g}$$

$$+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}}$$

$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)}$$

$$- \frac{a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$+ \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$- \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$- \frac{\left(b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$+ \frac{\left(b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g}$$
$$+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)}$$
$$- \frac{a(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$- \frac{ib(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$- \frac{b(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 368, normalized size of antiderivative = 0.50

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)(a+b\arcsin(cx))^2+c^2gx(f+gx)(a+b\arcsin(cx))^2+g^2(1-c^2x^2)(a+b\arcsi$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2 + c^2*g*x*(f +
g*x)*(a + b*ArcSin[c*x])^2 + g^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - 2*b*
c*(f + g*x)*(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*Sqrt[c^2
*f^2 - g^2]*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) +
 Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^
2 - g^2])]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 -
g^2])] + I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])
]))))/(2*b*c*g^2*(f + g*x)*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.65 (sec) , antiderivative size = 823, normalized size of antiderivative = 1.12

method	result
default	$\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2}df\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g\sqrt{c^{2}d}}+\frac{d\left(c^{2}f^{2}-g^{2}\right)\ln\left(\frac{-\frac{2d\left(c^{2}f\right.}{g}}{}\right.}{}\right.}{g}$
parts	$\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2}df\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g\sqrt{c^{2}d}}+\frac{d\left(c^{2}f^{2}-g^{2}\right)\ln\left(\frac{-\frac{2d\left(c^{2}f\right.}{g}}{}\right.}{}\right.}{g}$

```
[In] int((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x,method=_RETURNVERBOSE)

[Out] a/g*((-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d
*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+
f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)
^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g
^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))
/(x+f/g)))+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ar
csin(c*x)^2*f*c/g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2
)*x*c-1)*(arcsin(c*x)+I)/(c^2*x^2-1)/g+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/(c^2*x^2-1)/g+I*(-c^2*f^2+g^2)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln((I*c*f+(I
*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2
)))-I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/
2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))+dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g
-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-dilog((I*c*f+(I*c*x+(-
c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2))))/(c
^2*x^2-1)/g^2)
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{gx+f}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="fric
as")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}(a+b\operatorname{asin}{(cx)})}{f+gx}\,dx$$

```
[In] integrate((a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2)/(g*x+f),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="maxi
ma")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="giac
")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{f+g\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

3.35 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 860

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} - \frac{bc^2f\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc^2f\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

```
[Out] -a*(-c^2*d*x^2+d)^(1/2)/g/(g*x+f)-b*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g/(g*x
+f)-a*c^3*f^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)/(-c^2*x^2+
1)^(1/2)-1/2*b*c^3*f^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)
/(-c^2*x^2+1)^(1/2)+1/2*(c^2*f*x+g)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1
/2)/b/c/(c^2*f^2-g^2)/(g*x+f)^2/(-c^2*x^2+1)^(1/2)+b*c*ln(g*x+f)*(-c^2*d*x^
2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+a*c^2*f*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^
(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^
2*x^2+1)^(1/2)-I*b*c^2*f*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2
*x^2+1)^(1/2)+I*b*c^2*f*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*
f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*
x^2+1)^(1/2)-b*c^2*f*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2
```

```
-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/
2)+b*c^2*f*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2
)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*(a+
b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/(g*x+f)^2
```

Rubi [A] (verified)

Time = 1.81 (sec) , antiderivative size = 860, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.710, Rules used = {4861, 4849, 37, 4839, 12, 1665, 858, 222, 739, 210, 4883, 4881, 4737, 4857, 3405, 3404, 2296, 2221, 2317, 2438, 2747, 31}

$$\begin{aligned}\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = &-\frac{bf^2\sqrt{d-c^2dx^2}\arcsin(cx)^2c^3}{2g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\ &-\frac{af^2\sqrt{d-c^2dx^2}\arcsin(cx)c^3}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\ &+\frac{af\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)c^2}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\ &-\frac{ibf\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)c^2}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\ &+\frac{ibf\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)c^2}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\ &-\frac{bf\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)c^2}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\ &+\frac{bf\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)c^2}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\ &+\frac{b\sqrt{d-c^2dx^2}\log(f+gx)c}{g^2\sqrt{1-c^2x^2}} \\ &-\frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)}-\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} \\ &+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b(f+gx)^2c} \\ &+\frac{\left(fxc^2+g\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}c}\end{aligned}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

```
[Out] -((a*Sqrt[d - c^2*d*x^2])/(g*(f + g*x))) - (b*Sqrt[d - c^2*d*x^2]*ArcSin[c*
x])/(g*(f + g*x)) - (a*c^3*f^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(g^2*(c^2*f
```

```
^2 - g^2)*Sqrt[1 - c^2*x^2]) - (b*c^3*f^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2
)/(2*g^2*(c^2*f^2 - g^2)*Sqrt[1 - c^2*x^2]) + ((g + c^2*f*x)^2*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*(c^2*f^2 - g^2)*(f + g*x)^2*Sqrt[1 -
c^2*x^2]) + (Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(
2*b*c*(f + g*x)^2) + (a*c^2*f*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqr
t[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/(g^2*Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2
*x^2]) - (I*b*c^2*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[
c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^
2*x^2]) + (I*b*c^2*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin
[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c
^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[f + g*x])/(g^2*Sqrt[1 - c^2*x^2]) -
 (b*c^2*f*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqr
t[c^2*f^2 - g^2])])/(g^2*Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2]) + (b*c^2*f*
Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])])/(g^2*Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
```

```
[{a, c, d, e}, x]
```

Rule 858

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4839

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*n, Int[SimplifyIntegra
nd[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; FreeQ[
{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && LtQ[
m + p + 1, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
```

```
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} - \frac{\sqrt{d-c^2dx^2}\int \frac{(-2g-2c^2fx)(a+b\arcsin(cx))^2}{(f+gx)^3}\,dx}{2bc\sqrt{1-c^2x^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad - \frac{\sqrt{d-c^2dx^2}\int \frac{(g+c^2fx)^2(a+b\arcsin(cx))}{(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad - \frac{\sqrt{d-c^2dx^2}\int \frac{(g+c^2fx)^2(a+b\arcsin(cx))}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\
&= \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad - \frac{\sqrt{d-c^2dx^2}\int \left(\frac{a(g+c^2fx)^2}{(f+gx)^2\sqrt{1-c^2x^2}} + \frac{b(g+c^2fx)^2\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}\right)dx}{\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\
&= \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad - \frac{\left(a\sqrt{d-c^2dx^2}\right)\int \frac{(g+c^2fx)^2}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \frac{(g+c^2fx)^2\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\
&= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad - \frac{\left(a\sqrt{d-c^2dx^2}\right)\int \frac{c^2f(c^2f^2-g^2)+c^4f^2\left(\frac{c^2f^2}{g}-g\right)x}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{\left(c^2f^2-g^2\right)^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \left(\frac{c^4f^2\arcsin(cx)}{g^2\sqrt{1-c^2x^2}} + \frac{(-c^2f^2+g^2)^2\arcsin(cx)}{g^2(f+gx)^2\sqrt{1-c^2x^2}} + \frac{2c^2f(-c^2f^2+g^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx}{\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} + \frac{\left(g+c^2fx\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}}$$
$$+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} + \frac{\left(ac^2f\sqrt{d-c^2dx^2}\right)\int\frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(ac^4f^2\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{\left(c^2f^2-g^2\right)^2\sqrt{1-c^2x^2}} - \frac{\left(bc^4f^2\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}}$$
$$-\frac{\left(b(c^2f^2-g^2)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(2bc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}}$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}}$$
$$-\frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} + \frac{\left(g+c^2fx\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}}$$
$$+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2}$$
$$-\frac{\left(ac^2f\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{1}{-c^2f^2+g^2-x^2}\,dx,x,\frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(bc(c^2f^2-g^2)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{x}{(cf+g\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(2bc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{x}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}}$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{\left(bc^2f\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\cos(x)}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{g\sqrt{1-c^2x^2}} - \frac{\left(4bc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}}$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1}{cf+x}\,dx,x,cgx\right)}{g^2\sqrt{1-c^2x^2}} - \frac{\left(2bc^2f\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}} + \frac{\left(4ibc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}} - \frac{\left(4ibc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ibc^2f\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ibc^2f\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ibc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{g^2(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ibc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{g^2(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2}$$
$$+ \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$- \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(ibc^2f\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(ibc^2f\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2bc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{g^2(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2bc^2f(-c^2f^2+g^2)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{g^2(c^2f^2-g^2)^{3/2}\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} \\
&- \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2\left(c^2f^2-g^2\right)\sqrt{1-c^2x^2}} + \frac{\left(g+c^2fx\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}} \\
&+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&+ \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} - \frac{2bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(bc^2f\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bc^2f\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2}$$
$$+ \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$- \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} - \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$
$$+ \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.37 (sec) , antiderivative size = 600, normalized size of antiderivative = 0.70

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(\frac{(c^2f^2-g^2)(a+b\arcsin(cx))^2}{g^2(f+gx)^2} - \frac{2c^2f(a+b\arcsin(cx))^2}{g^2(f+gx)} + \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{(f+gx)^2} + \frac{4bc^3f\left(-i(a+b\arcsin(cx))\left(\log\left(1\right.\right.\right.}{}\right.}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*x
)^2) - (2*c^2*f*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*x)) + ((1 - c^2*x^2)*(a
+ b*ArcSin[c*x])^2)/(f + g*x)^2 + (4*b*c^3*f*((-I)*(a + b*ArcSin[c*x])*(Log
[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E
^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, (I*E^(I*Ar
cSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*
```

```
x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/(g^2*Sqrt[c^2*f^2 - g^2]) + (2*b*c^2*
(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g*x)) + b*Log[f + g*x
] + (c*f*(I*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) +
Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]) + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2
])] - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/S
qrt[c^2*f^2 - g^2]))/g^2))/(2*b*c*Sqrt[1 - c^2*x^2])
```

Maple [A] (warning: unable to verify)

Time = 0.66 (sec) , antiderivative size = 1352, normalized size of antiderivative = 1.57

method	result	size
default	Expression too large to display	1352
parts	Expression too large to display	1352

```
[In] int((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x,method=_RETURNVERBOS
E)
```

```
[Out] a/g^2*(1/d/(c^2*f^2-g^2)*g^2/(x+f/g)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-
d*(c^2*f^2-g^2)/g^2)^(3/2)-c^2*f*g/(c^2*f^2-g^2)*((-(x+f/g)^2*c^2*d+2*c^2*d
*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1/2)*arctan((c^2
*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2
))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/
g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*
c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g)))+2*c^2/(c^2*f^2-g^2)
*g^2*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2*c^2*d*f
/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g^2-4*c^
4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d
+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))))+b*(1/2*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c/g^2-(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)*(c^2*f*x+g-I*(-c^2*x^
2+1)^(1/2)*c*f)/(c^2*x^2-1)/g^2/(g*x+f)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)
^(1/2)*(ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f
-(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*c*f-ln((I*c*f+(I*c
*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2))
)*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*c*f-I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(
1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^
(1/2)*c*f+I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))
/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f+2*ln(I*c*x+(-c^2*x^
2+1)^(1/2))*c^2*f^2-ln((I*c*x+(-c^2*x^2+1)^(1/2))^2*g+2*I*c*f*(I*c*x+(-c^2*
x^2+1)^(1/2))-g)*c^2*f^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*g^2+ln((I*c*x+(-c^2
*x^2+1)^(1/2))^2*g+2*I*c*f*(I*c*x+(-c^2*x^2+1)^(1/2))-g)*g^2)*c/(c^2*x^2-1)
/g^2/(c^2*f^2-g^2))
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{(gx+f)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g^2*x^2 + 2*f*g*x + f^2)
, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}{(f+gx)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2)/(g*x+f)**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="ma
xima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{(f+g\,x)^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2, x)
```

3.36 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 959

$$\begin{aligned}
&\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{3bdf^2gx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} \\
&+\frac{2bdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}-\frac{5bcdf^3x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3bdfg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} \\
&-\frac{2bcdf^2gx^3\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}+\frac{bdg^3x^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}+\frac{bc^3df^3x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} \\
&-\frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{3bc^3df^2gx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&-\frac{8bcdg^3x^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}}{12\sqrt{1-c^2x^2}}+\frac{bc^3dg^3x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&+\frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} \\
&+\frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&-\frac{3df^2g\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&-\frac{dg^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&+\frac{dg^3\left(1-c^2x^2\right)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+\frac{3df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}+\frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 3/8*d*f^3*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/16*d*f*g^2*x*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+3/8*d*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d
*x^2+d)^(1/2)+1/4*d*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)+1/2*d*f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/5*
d*f^2*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2-1/5*d*g^3
*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/7*d*g^3*(-c^2*
x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+3/5*b*d*f^2*g*x*(-c^2*d
*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/35*b*d*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/
(-c^2*x^2+1)^(1/2)-5/16*b*c*d*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)+3/32*b*d*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/5*b*c*d*f
^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/105*b*d*g^3*x^3*(-c^2*d*
x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/16*b*c^3*d*f^3*x^4*(-c^2*d*x^2+d)^(1/2)
/(-c^2*x^2+1)^(1/2)-7/32*b*c*d*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^
(1/2)+3/25*b*c^3*d*f^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-8/175*
b*c*d*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/12*b*c^3*d*f*g^2*x^
6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/49*b*c^3*d*g^3*x^7*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16*d*f^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)/b/c/(-c^2*x^2+1)^(1/2)+3/32*d*f*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 959, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.548$, Rules used = {4861, 4847, 4743, 4741, 4737, 30, 14, 4767, 200, 4787, 4783, 4795, 272, 45, 4779,

12, 380}

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{bc^3dg^3\sqrt{d-c^2dx^2}x^7}{49\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3dfg^2\sqrt{d-c^2dx^2}x^6}{12\sqrt{1-c^2x^2}}-\frac{8bcdg^3\sqrt{d-c^2dx^2}x^5}{175\sqrt{1-c^2x^2}}$$
$$+\frac{3bc^3df^2g\sqrt{d-c^2dx^2}x^5}{25\sqrt{1-c^2x^2}}+\frac{bc^3df^3\sqrt{d-c^2dx^2}x^4}{16\sqrt{1-c^2x^2}}$$
$$-\frac{7bcdfg^2\sqrt{d-c^2dx^2}x^4}{32\sqrt{1-c^2x^2}}+\frac{3}{8}dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3$$
$$+\frac{1}{2}dfg^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3+\frac{bdg^3\sqrt{d-c^2dx^2}x^3}{105c\sqrt{1-c^2x^2}}$$
$$-\frac{2bcdf^2g\sqrt{d-c^2dx^2}x^3}{5\sqrt{1-c^2x^2}}-\frac{5bcdf^3\sqrt{d-c^2dx^2}x^2}{16\sqrt{1-c^2x^2}}+\frac{3bdfg^2\sqrt{d-c^2dx^2}x^2}{32c\sqrt{1-c^2x^2}}$$
$$+\frac{3}{8}df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x-\frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{16c^2}$$
$$+\frac{1}{4}df^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x$$
$$+\frac{2bdg^3\sqrt{d-c^2dx^2}x}{35c^3\sqrt{1-c^2x^2}}+\frac{3bdf^2g\sqrt{d-c^2dx^2}x}{5c\sqrt{1-c^2x^2}}$$
$$+\frac{3df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}+\frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}$$
$$+\frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$-\frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4}$$
$$-\frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2}$$

```
[In] Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*f^2*g*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) + (2*b*d*g^3*x*
Sqrt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) - (5*b*c*d*f^3*x^2*Sqrt[d -
 c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (3*b*d*f*g^2*x^2*Sqrt[d - c^2*d*x^2])
/(32*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d*f^2*g*x^3*Sqrt[d - c^2*d*x^2])/(5*Sqrt
[1 - c^2*x^2]) + (b*d*g^3*x^3*Sqrt[d - c^2*d*x^2])/(105*c*Sqrt[1 - c^2*x^2]
) + (b*c^3*d*f^3*x^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (7*b*c*d
*f*g^2*x^4*Sqrt[d - c^2*d*x^2])/(32*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*f^2*g*x
^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) - (8*b*c*d*g^3*x^5*Sqrt[d -
c^2*d*x^2])/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*f*g^2*x^6*Sqrt[d - c^2*d*x^2
])/(12*Sqrt[1 - c^2*x^2]) + (b*c^3*d*g^3*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[
1 - c^2*x^2]) + (3*d*f^3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 - (3*
d*f*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c^2) + (3*d*f*g^2*x^
```

```
3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (d*f^3*x*(1 - c^2*x^2)*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (d*f*g^2*x^3*(1 - c^2*x^2)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - (3*d*f^2*g*(1 - c^2*x^2)^2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2) - (d*g^3*(1 - c^2*x^2)^2*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^4) + (d*g^3*(1 - c^2*x^2)^3*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(7*c^4) + (3*d*f^3*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2]) + (3*d*f*g^2*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
```

```
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int (f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+3f^2gx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+3fg\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(df^3\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3df^2g\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(dg^3\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} - \frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} + \frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} + \frac{\left(3df^3\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcdf^3\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)\,dx}{4\sqrt{1-c^2x^2}} + \frac{\left(3bdf^2g\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^2\,dx}{5c\sqrt{1-c^2x^2}} + \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcdfg^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcdg^3\sqrt{d-c^2dx^2}\right)\int \frac{(-2-5c^2x^2)(1-c^2x^2)^2}{35c^4}\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&- \frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&+ \frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+ \frac{\left(3df^3\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(bcdf^3\sqrt{d-c^2dx^2}\right)\int\left(x-c^2x^3\right)\,dx}{4\sqrt{1-c^2x^2}} \\
&- \frac{\left(3bcdf^3\sqrt{d-c^2dx^2}\right)\int x\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(3bdf^2g\sqrt{d-c^2dx^2}\right)\int\left(1-2c^2x^2+c^4x^4\right)\,dx}{5c\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&- \frac{\left(3bcdfg^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(bcdfg^2\sqrt{d-c^2dx^2}\right)\int\left(x^3-c^2x^5\right)\,dx}{2\sqrt{1-c^2x^2}} \\
&- \frac{\left(bdg^3\sqrt{d-c^2dx^2}\right)\int\left(-2-5c^2x^2\right)\left(1-c^2x^2\right)^2\,dx}{35c^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3bdf^2gx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{5bcdf^3x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{2bcdf^2gx^3\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3df^3x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} + \frac{3bc^3df^2gx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}}{12\sqrt{1-c^2x^2}} + \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&- \frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&+ \frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+ \frac{3df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}} + \frac{\left(3bdfg^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{16c\sqrt{1-c^2x^2}} \\
&- \frac{\left(bdg^3\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+8c^4x^4-5c^6x^6\right)\,dx}{35c^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3bdf^2gx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} + \frac{2bdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} - \frac{5bcdf^3x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} \\
&+ \frac{3bdfg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{2bcdf^2gx^3\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}} \\
&+ \frac{bdg^3x^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}} + \frac{bc^3df^3x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} \\
&+ \frac{3bc^3df^2gx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} - \frac{8bcdg^3x^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}} + \frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}}{12\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3dg^3x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&- \frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&+ \frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+ \frac{3df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} + \frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.48

$$
\int (f+gx)^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(11025a^2cf(2c^2f^2+g^2) - 210ab\sqrt{1-c^2x^2}(32g^3+c^2g(336f^2+105fgx+\right.}{}
$$

```
[In] Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f*(2*c^2*f^2 + g^2) - 210*a*b*Sqrt[1 -
c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(35
*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f^2
*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + b^2*c*x*(6720*g^3 + 35*c^2*g*(2016*f^
2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^2*g*x + 1225*f*g^
2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x + 4900*f*g^2*x^2
+ 1200*g^3*x^3)) - 210*b*(-105*a*c*f*(2*c^2*f^2 + g^2) + b*Sqrt[1 - c^2*x^2
```

```
]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 +
84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x +
245*f*g^2*x^2 + 64*g^3*x^3)))*ArcSin[c*x] + 11025*b^2*c*f*(2*c^2*f^2 + g^2)
*ArcSin[c*x]^2))/(117600*b*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.72 (sec) , antiderivative size = 2074, normalized size of antiderivative = 2.16

method	result	size
default	Expression too large to display	2074
parts	Expression too large to display	2074

```
[In] int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/
(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*x^2*
(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-1/6*x
*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*
x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x
^2+d)^(1/2)))))-3/5*f^2*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b*(-3/32*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2*f^2+g^
2)*d-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c
^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*
I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g^3*(I+7*arcsin(
c*x))*d/c^4/(c^2*x^2-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1
/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^
2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(I+6*ar
csin(c*x))*d/c^3/(c^2*x^2-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c
^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x
^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(12*I*f^2*c^2+60*arcsin(c*x)*c^2*f^2
-I*g^2-5*arcsin(c*x)*g^2)*d/c^4/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-
8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*
c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(2*I*c^2*f^2+8*arcsin(c*x)*c^2*f^2-3*
I*g^2-12*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c
^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(8*I*c^2*f^2+8*arcsin(c*x)*c^2*f^2+I*g
^2+arcsin(c*x)*g^2)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(8*arcsin(c*x)*c^2*f^2-8*I*c^2*f^2+arcsin(c*
x)*g^2-I*g^2)*d/c^4/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2
+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-16*I*c^2*f^2+32
*arcsin(c*x)*c^2*f^2-3*I*g^2+6*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)+1/384*(-d
*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2
```

```
+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(36*arcsin(c*x)*c^2*f^2-12*I*f^2*c^2+3*arcsin(
c*x)*g^2-I*g^2)*d/c^4/(c^2*x^2-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(32*I*(-c^2*
x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7-48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5+
18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^
2*(-I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*
c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*
c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*
x*c-25*c^2*x^2+1)*g^3*(-I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*
x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(66*I*c^2*f^2+270*arcs
in(c*x)*c^2*f^2+7*I*g^2+15*arcsin(c*x)*g^2)*cos(4*arcsin(c*x))*d/c^4/(c^2*x
^2-1)-1/4800*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*
(168*I*c^2*f^2+360*arcsin(c*x)*c^2*f^2+11*I*g^2+45*arcsin(c*x)*g^2)*sin(4*a
rcsin(c*x))*d/c^4/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(
-c^2*x^2+1)^(1/2)-I)*f*(34*I*c^2*f^2+56*arcsin(c*x)*c^2*f^2+3*I*g^2+24*arcs
in(c*x)*g^2)*cos(3*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(10*I*c^2*f^2+24*arcsin(c*x)*c^2
*f^2+3*I*g^2)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

```
[Out] integral(-(a*c^2*d*g^3*x^5 + 3*a*c^2*d*f*g^2*x^4 - 3*a*d*f^2*g*x - a*d*f^3
+ (3*a*c^2*d*f^2*g - a*d*g^3)*x^3 + (a*c^2*d*f^3 - 3*a*d*f*g^2)*x^2 + (b*c^
2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*g*x - b*d*f^3 + (3*b*c^2*d*f^
2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^3 (b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d
*x^2 + d)^(5/2)/(c^4*d))*a*g^3 + 1/16*a*f*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c
^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 +
3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a*f^2*g/(c^2*d) + s
qrt(d)*integrate(-(b*c^2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*g*x -
b*d*f^3 + (3*b*c^2*d*f^2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g^2)*x^2
)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)),
x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.37 $\int (f+gx)^2 (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 680

$$\begin{aligned}\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx &= \frac{2bdfgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} \\ &- \frac{5bcdf^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{4bcdfgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} \\ &+ \frac{bc^3df^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{2bc^3dfgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\ &+ \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &- \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &+ \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &+ \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &- \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\ &+ \frac{3df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 3/8*d*f^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/16*d*g^2*x*(a+b*arcsin
(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/8*d*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)+1/4*d*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1
/6*d*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-2/5*d*f*g*
(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/5*b*d*f*g*x*(-c
^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d*f^2*x^2*(-c^2*d*x^2+d)^(1
/2)/(-c^2*x^2+1)^(1/2)+1/32*b*d*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)
```

```
^(1/2)-4/15*b*c*d*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*c^
3*d*f^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/96*b*c*d*g^2*x^4*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*f*g*x^5*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)+1/36*b*c^3*d*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)+3/16*d*f^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1
)^(1/2)+1/32*d*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2
+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 680, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.387$, Rules used = {4861, 4847, 4743, 4741, 4737, 30, 14, 4767, 200, 4787, 4783, 4795}

$$\begin{aligned}
&\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{3df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} \\
&-\frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&-\frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2}+\frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+\frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}-\frac{5bcdf^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{2bdfgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} \\
&-\frac{4bcdfgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bdg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdg^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} \\
&+\frac{bc^3df^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{2bc^3dfgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[In] Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*f*g*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (5*b*c*d*f^2*x^
2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (b*d*g^2*x^2*Sqrt[d - c^2*d
*x^2])/(32*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d*f*g*x^3*Sqrt[d - c^2*d*x^2])/(15
*Sqrt[1 - c^2*x^2]) + (b*c^3*d*f^2*x^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^
2*x^2]) - (7*b*c*d*g^2*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (2
*b*c^3*d*f*g*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) + (b*c^3*d*g^2
*x^6*Sqrt[d - c^2*d*x^2])/(36*Sqrt[1 - c^2*x^2]) + (3*d*f^2*x*Sqrt[d - c^2*
```

```
d*x^2]*(a + b*ArcSin[c*x]))/8 - (d*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(16*c^2) + (d*g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (
d*f^2*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (d*g^2*x
^3*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/6 - (2*d*f*g*(1 -
 c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2) + (3*d*f^2*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2]) + (d*g^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
```

```
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
```

```
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] && !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int (f+gx)^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+2fgx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+g^2x\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(df^2\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2dfg\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} + \frac{\left(3df^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcdf^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,dx}{4\sqrt{1-c^2x^2}} + \frac{\left(2bdfg\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^2\,dx}{5c\sqrt{1-c^2x^2}} + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcdg^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)\,dx}{6\sqrt{1-c^2x^2}}$$

$$= \frac{3}{8} d f^2 x \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) + \frac{1}{8} d g^2 x^3 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) + \frac{1}{4} d f^2 x \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) + \frac{1}{6} d g^2 x^3 \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) - \frac{2 d f g (1-c^2 x^2)^2 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))}{5 c^2} + \frac{\left(3 d f^2 \sqrt{d-c^2 d x^2}\right) \int \frac{a+b \arcsin(cx)}{\sqrt{1-c^2 x^2}} \, dx}{8 \sqrt{1-c^2 x^2}} - \frac{\left(b c d f^2 \sqrt{d-c^2 d x^2}\right) \int \left(x-c^2 x^3\right) \, dx}{4 \sqrt{1-c^2 x^2}} - \frac{\left(3 b c d f^2 \sqrt{d-c^2 d x^2}\right) \int x \, dx}{8 \sqrt{1-c^2 x^2}} + \frac{\left(2 b d f g \sqrt{d-c^2 d x^2}\right) \int \left(1-2 c^2 x^2+c^4 x^4\right) \, dx}{5 c \sqrt{1-c^2 x^2}} + \frac{\left(d g^2 \sqrt{d-c^2 d x^2}\right) \int \frac{x^2 (a+b \arcsin(cx))}{\sqrt{1-c^2 x^2}} \, dx}{8 \sqrt{1-c^2 x^2}} - \frac{\left(b c d g^2 \sqrt{d-c^2 d x^2}\right) \int x^3 \, dx}{8 \sqrt{1-c^2 x^2}} - \frac{\left(b c d g^2 \sqrt{d-c^2 d x^2}\right) \int \left(x^3-c^2 x^5\right) \, dx}{6 \sqrt{1-c^2 x^2}}$$

$$= \frac{2 b d f g x \sqrt{d-c^2 d x^2}}{5 c \sqrt{1-c^2 x^2}} - \frac{5 b c d f^2 x^2 \sqrt{d-c^2 d x^2}}{16 \sqrt{1-c^2 x^2}} - \frac{4 b c d f g x^3 \sqrt{d-c^2 d x^2}}{15 \sqrt{1-c^2 x^2}} + \frac{b c^3 d f^2 x^4 \sqrt{d-c^2 d x^2}}{16 \sqrt{1-c^2 x^2}} - \frac{7 b c d g^2 x^4 \sqrt{d-c^2 d x^2}}{96 \sqrt{1-c^2 x^2}} + \frac{2 b c^3 d f g x^5 \sqrt{d-c^2 d x^2}}{25 \sqrt{1-c^2 x^2}} + \frac{b c^3 d g^2 x^6 \sqrt{d-c^2 d x^2}}{36 \sqrt{1-c^2 x^2}} + \frac{3}{8} d f^2 x \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) - \frac{d g^2 x \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))}{16 c^2} + \frac{1}{8} d g^2 x^3 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) + \frac{1}{4} d f^2 x \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) + \frac{1}{6} d g^2 x^3 \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) - \frac{2 d f g (1-c^2 x^2)^2 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))}{5 c^2} + \frac{3 d f^2 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))^2}{16 b c \sqrt{1-c^2 x^2}} + \frac{\left(d g^2 \sqrt{d-c^2 d x^2}\right) \int \frac{a+b \arcsin(cx)}{\sqrt{1-c^2 x^2}} \, dx}{16 c^2 \sqrt{1-c^2 x^2}} + \frac{\left(b d g^2 \sqrt{d-c^2 d x^2}\right) \int x \, dx}{16 c \sqrt{1-c^2 x^2}}$$

$$
\begin{aligned}
&= \frac{2bdfgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{5bcdf^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} \\
&\quad - \frac{4bcdfgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3df^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{2bc^3dfgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&\quad + \frac{3df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.49

$$
\int (f+gx)^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(225a^2(6c^2f^2+g^2)+b^2c^2x(450c^2f^2x(-5+c^2x^2)+192fg(15-10c^2x^2+
$$

```
[In] Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(225*a^2*(6*c^2*f^2 + g^2) + b^2*c^2*x*(450*c^2*f^2*
x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*x*(9 - 21
*c^2*x^2 + 8*c^4*x^4)) - 30*a*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^
2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)) +
 30*b*(15*a*(6*c^2*f^2 + g^2) - b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2
)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4))
)*ArcSin[c*x] + 225*b^2*(6*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(7200*b*c^3*Sqrt[
1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 1535, normalized size of antiderivative = 2.26

method	result	size
default	Expression too large to display	1535
parts	Expression too large to display	1535

```
[In] int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/
(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*x*(-
c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(
-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+
d)^(1/2)))))-2/5*f*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b*(-1/32*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(6*c^2*f^2+g^2)*d-1/
2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48
*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38
*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1
)-1/400*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/
2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2
)*x*c-1)*f*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/
2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^
2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(8*arcsin(c*x)*c^2*f^2+2*I*c^2*f^2
-4*arcsin(c*x)*g^2-I*g^2)*d/c^3/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2
*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/8*
(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x
)-I)*d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)
*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-16*I*c^2*f^2+32*arcsin(c*x
)*c^2*f^2-I*g^2+2*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)+1/48*(-d*(c^2*x^2-1))^
(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-
5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/2304*(-d*(c^2*x^2-1
))^(1/2)*(32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7-48*I*(-c^2*x^2+1)^(1/2
)*x^4*c^4-64*c^5*x^5+18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3-I*(-c^2*x^2
+1)^(1/2)-6*c*x)*g^2*(-I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/600*(-d*(c^2*x^
2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(11*I+45*arcsin(c*x))*
cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/300*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d/c
^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/
2)-I)*(34*I*c^2*f^2+56*arcsin(c*x)*c^2*f^2+I*g^2+8*arcsin(c*x)*g^2)*cos(3*a
rcsin(c*x))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^
(1/2)*x*c+c^2*x^2-1)*(10*I*c^2*f^2+24*arcsin(c*x)*c^2*f^2+I*g^2)*sin(3*arcs
in(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

```
[Out] integral(-(a*c^2*d*g^2*x^4 + 2*a*c^2*d*f*g*x^3 - 2*a*d*f*g*x - a*d*f^2 + (a
*c^2*d*f^2 - a*d*g^2)*x^2 + (b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*f*
g*x - b*d*f^2 + (b*c^2*d*f^2 - b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 +
 d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a*f^2 + 1/48*a*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c^2*d
*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*arcs
in(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*f*g/(c^2*d) + sqrt(d)*integrate
(-(b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*f*g*x - b*d*f^2 + (b*c^2*d*f
^2 - b*d*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.38 $\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx)) \, dx$

Optimal result

Integrand size = 29, antiderivative size = 370

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx)) \, dx = \frac{bdgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{5bcdfx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{2bcdgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3dfx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bc^3dgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} + \frac{3df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

```
[Out] 3/8*d*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/4*d*f*x*(-c^2*x^2+1)*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/5*d*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x)
)*(-c^2*d*x^2+d)^(1/2)/c^2+1/5*b*d*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^
(1/2)-5/16*b*c*d*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/15*b*c*d*g
*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*c^3*d*f*x^4*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/25*b*c^3*d*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*
x^2+1)^(1/2)+3/16*d*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^
2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4861, 4847, 4743, 4741, 4737, 30, 14, 4767, 200}

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{3df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} - \frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} - \frac{5bcdfx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bdgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{2bcdgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3dfx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bc^3dgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*g*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (5*b*c*d*f*x^2*Sqrt
[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (2*b*c*d*g*x^3*Sqrt[d - c^2*d*x^2
])/(15*Sqrt[1 - c^2*x^2]) + (b*c^3*d*f*x^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1
- c^2*x^2]) + (b*c^3*d*g*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) +
(3*d*f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (d*f*x*(1 - c^2*x^2)*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 - (d*g*(1 - c^2*x^2)^2*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2) + (3*d*f*Sqrt[d - c^2*d*x^2]*(a + b
*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(f(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+gx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\right)\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(df\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(dg\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} + \frac{\left(3df\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcdf\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)\,dx}{4\sqrt{1-c^2x^2}} + \frac{\left(bdg\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^2\,dx}{5c\sqrt{1-c^2x^2}}$$

$$= \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} + \frac{\left(3df\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(bcdf\sqrt{d-c^2dx^2}\right)\int \left(x-c^2x^3\right)\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(3bcdf\sqrt{d-c^2dx^2}\right)\int x\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(bdg\sqrt{d-c^2dx^2}\right)\int \left(1-2c^2x^2+c^4x^4\right)\,dx}{5c\sqrt{1-c^2x^2}}$$

$$= \frac{bdgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{5bcdfx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{2bcdgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3dfx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bc^3dgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} + \frac{3df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 216, normalized size of antiderivative = 0.58

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(225a^2cf-30ab\sqrt{1-c^2x^2}\left(8g(-1+c^2x^2)^2+5c^2fx(-5+2c^2x^2)\right)+b^2cx\right.}{}$$

```
[In] Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(225*a^2*c*f - 30*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 + c
^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*x*(75*c^2*f*x*(-5 + c^2*x^2
) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + 30*b*(15*a*c*f + b*Sqrt[1 - c^2*x
^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*ArcSin[c*x] + 225*b
^2*c*f*ArcSin[c*x]^2))/(1200*b*c^2*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 1014, normalized size of antiderivative = 2.74

method	result
default	$\frac{afx(-c^2dx^2+d)^{\frac{3}{2}}}{4}+\frac{3afdx\sqrt{-c^2dx^2+d}}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b\left(-\frac{3\sqrt{-d(c^2x^2-1)}\sqrt{-c}}{16c(c^2}\right.$
parts	$\frac{afx(-c^2dx^2+d)^{\frac{3}{2}}}{4}+\frac{3afdx\sqrt{-c^2dx^2+d}}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b\left(-\frac{3\sqrt{-d(c^2x^2-1)}\sqrt{-c}}{16c(c^2}\right.$

```
[In] int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*f*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a*f*d^2
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a*g/c^2/d*(
-c^2*d*x^2+d)^(5/2)+b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c
^2*x^2-1)*arcsin(c*x)^2*f*d-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4
*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3
*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/
256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(
-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*arcsi
n(c*x)+I)*d/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+
1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-
1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*
(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)+1/96*(-d*(c^
```

```
2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^
(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/1200*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(11*I+45*arcsin(c*x
))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2-1))^(1/2)*(I*c^2
*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d/
c^2/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1
/2)-I)*f*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/c/(c^2*x^2-1)+3/256*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(5*I+12*arcsin(c
*x))*sin(3*arcsin(c*x))*d/c/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin{(cx)}+a)\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fric
as")
[Out] integral(-(a*c^2*d*g*x^3 + a*c^2*d*f*x^2 - a*d*g*x - a*d*f + (b*c^2*d*g*x^3
 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int\left(-d(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}{(cx)})(f+gx)\,dx$$

```
[In] integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx) \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxi
ma")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a*g/(c^2*d) + sqrt(d)*integra
te(-(b*c^2*d*g*x^3 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*sqrt(c*x + 1)*sqrt(-c
*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac
")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx) \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.39 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1073

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3}-\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} + \frac{bcd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}}{g^3\sqrt{1-c^2x^2}}-\frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}}-\frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} - \frac{cd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^3\sqrt{1-c^2x^2}} - \frac{d(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)\sqrt{1-c^2x^2}} - \frac{d(cf-g)(cf+g)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^2(f+gx)} + \frac{ad(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

```
[Out] -a*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/g^3-b*d*(c*f-g)*(c*f+g)*arcsin(c*
x)*(-c^2*d*x^2+d)^(1/2)/g^3+1/2*c^2*d*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/g^2+1/3*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g-1/3*b
```

```
*c*d*x*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+b*c*d*(c*f-g)*(c*f+g)*x*(-
c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/4*b*c^3*d*f*x^2*(-c^2*d*x^2+d)^
(1/2)/g^2/(-c^2*x^2+1)^(1/2)+1/9*b*c^3*d*x^3*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x
^2+1)^(1/2)+1/4*c*d*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/g^2/(-c^2*
x^2+1)^(1/2)-1/2*c*d*(c*f-g)*(c*f+g)*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)/b/g^3/(-c^2*x^2+1)^(1/2)-1/2*d*(c^2*f^2-g^2)^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/c/g^4/(g*x+f)/(-c^2*x^2+1)^(1/2)+a*d*(c^2*f^2-g^2)^(3/2
)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)
^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+I*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2
)/g^4/(-c^2*x^2+1)^(1/2)-I*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*ln(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4
/(-c^2*x^2+1)^(1/2)-b*d*(c^2*f^2-g^2)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^
(1/2)+b*d*(c^2*f^2-g^2)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f
+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-1/2*d*(c
*f-g)*(c*f+g)*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b
/c/g^2/(g*x+f)
```

Rubi [A] (verified)

Time = 1.47 (sec) , antiderivative size = 1073, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.742$, Rules used = {4861, 4851, 4741, 4737, 30, 4767, 4849, 697, 4841, 6874, 739, 210, 1668, 12, 4883,

4881, 8, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{bdx^3\sqrt{d-c^2dx^2}c^3}{9g\sqrt{1-c^2x^2}} - \frac{bdfx^2\sqrt{d-c^2dx^2}c^3}{4g^2\sqrt{1-c^2x^2}} + \frac{dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^2}{2g^2} - \frac{d(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c}{2bg^3\sqrt{1-c^2x^2}} + \frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c}{4bg^2\sqrt{1-c^2x^2}} + \frac{bd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}c}{g^3\sqrt{1-c^2x^2}} - \frac{bdx\sqrt{d-c^2dx^2}c}{3g\sqrt{1-c^2x^2}} - \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{ad(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{d(cf-g)(cf+g)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^2(f+gx)c} - \frac{d(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^4(f+gx)\sqrt{1-c^2x^2}c}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] -((a*d*(c*f - g)*(c*f + g)*Sqrt[d - c^2*d*x^2])/g^3) - (b*c*d*x*Sqrt[d - c^
2*d*x^2])/(3*g*Sqrt[1 - c^2*x^2]) + (b*c*d*(c*f - g)*(c*f + g)*x*Sqrt[d - c
^2*d*x^2])/(g^3*Sqrt[1 - c^2*x^2]) - (b*c^3*d*f*x^2*Sqrt[d - c^2*d*x^2])/(4
*g^2*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^3*Sqrt[d - c^2*d*x^2])/(9*g*Sqrt[1 - c
^2*x^2]) - (b*d*(c*f - g)*(c*f + g)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/g^3 +
```

```
(c^2*d*f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*g^2) + (d*(1 - c^2*x
^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*g) + (c*d*f*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^2)/(4*b*g^2*Sqrt[1 - c^2*x^2]) - (c*d*(c*f - g)*(c
*f + g)*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*g^3*Sqrt[1 - c^2*
x^2]) - (d*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*
b*c*g^4*(f + g*x)*Sqrt[1 - c^2*x^2]) - (d*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*
x^2]*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*g^2*(f + g*x)) + (a*
d*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*
f^2 - g^2]*Sqrt[1 - c^2*x^2])])/(g^4*Sqrt[1 - c^2*x^2]) - (I*b*d*(c^2*f^2 -
 g^2)^(3/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)
/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + (I*b*d*(c^2*f^2 -
g^2)^(3/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/
(c*f + Sqrt[c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) - (b*d*(c^2*f^2 - g^2
)^(3/2)*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[
c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + (b*d*(c^2*f^2 - g^2)^(3/2)*Sqrt
[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^
2])])/(g^4*Sqrt[1 - c^2*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
```

```
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(\frac{c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^2} - \frac{c^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g} + \frac{(-c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^2(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{f+gx}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^2df\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g^2\sqrt{1-c^2x^2}} - \frac{\left(c^2d\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g\sqrt{1-c^2x^2}}$$

$$= \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int \frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^2}{(f+gx)^2}\,dx}{2bc\sqrt{1-c^2x^2}} + \frac{\left(c^2df\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2g^2\sqrt{1-c^2x^2}} - \frac{\left(bc^3df\sqrt{d-c^2dx^2}\right)\int x\,dx}{2g^2\sqrt{1-c^2x^2}} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)\,dx}{3g\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad + \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad + \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\left(-\frac{a(c^2f^2-g^2+c^2fgx+c^2g^2x^2)}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{b(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(ad\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{c^2f^2-g^2+c^2fgx+c^2g^2x^2}{(f+gx)\sqrt{1-c^2x^2}}dx}{g^2\sqrt{1-c^2x^2}} - \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}dx}{g^2\sqrt{1-c^2x^2}}$$

$$= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} - \frac{\left(ad\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{c^2g^2(c^2f^2-g^2)}{(f+gx)\sqrt{1-c^2x^2}}dx}{c^2g^4\sqrt{1-c^2x^2}} - \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\left(\frac{c^2gx\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{(c^2f^2-g^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{\left(bc^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(ad\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad - \frac{\left(bcd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int 1\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(ad\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{1}{-c^2f^2+g^2-x^2}\,dx,x,\frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{x}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad + \frac{ad(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2bd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} - \frac{bcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} - \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} + \frac{ad(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{\left(2ibd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{\left(2ibd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} \\
&- \frac{bcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} \\
&- \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&+ \frac{ad(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(ibd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx\right.}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(ibd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx\right.}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} \\
&- \frac{bcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} \\
&- \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&+ \frac{ad(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}} \\
&- \frac{bcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}} \\
&- \frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&+ \frac{ad(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ibd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{bd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{bd(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.19 (sec) , antiderivative size = 507, normalized size of antiderivative = 0.47

$$
\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-9bc^3fx^2+4bcgx(-3+c^2x^2)+18c^2fx\sqrt{1-c^2x^2}\right.}{}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-9*b*c^3*f*x^2 + 4*b*c*g*x*(-3 + c^2*x^2) + 18*c^2*
f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 12*g*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]) + (9*c*f*(a + b*ArcSin[c*x])^2)/b + (18*(c^2*f^2 - g^2)*(-1 +
 c^2*x^2)*(a + b*ArcSin[c*x])^2)/(b*c*(f + g*x)) - (18*(c^2*f^2 - g^2)*((c^
2*f^2 - g^2)*(a + b*ArcSin[c*x])^2 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*x])^
2 - 2*b*c*(f + g*x)*(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*
Sqrt[c^2*f^2 - g^2]*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(
-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqr
t[c^2*f^2 - g^2])]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^
2*f^2 - g^2])] + I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]))))/(b*c*g^2*(f + g*x))))/(36*g^2*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.64 (sec) , antiderivative size = 1546, normalized size of antiderivative = 1.44

method	result	size
default	Expression too large to display	1546
parts	Expression too large to display	1546

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE)
```

```
[Out] a/g*(1/3*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(3/2)+c
^2*d*f/g*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2*c^2
*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g^2-
4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c
^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)))-d*(c^2*f^2-g^2)/g^2*(
(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d*f/g/
(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-
d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2
)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(
1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f
/g))))+b*(1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(
c*x)^2*f*(2*c^2*f^2-3*g^2)*d*c/g^4-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5
*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*
arcsin(c*x))*d/(c^2*x^2-1)/g+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(I+2*arcsin(c*x))*d*
c/(c^2*x^2-1)/g^2-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(4*c^2*f^2-5*g^2)*(arcsin(c*x)+I)*d/(c^2*x^2-1)/g^3-1/8*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(4*c^2*f^2-5*g^2)*(arcsin(c
*x)-I)*d/(c^2*x^2-1)/g^3+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d*c/(c
^2*x^2-1)/g^2-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4
*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/(c^2*
x^2-1)/g-I*(-c^2*f^2+g^2)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
```

```
c^2*x^2-1)/g^4*(I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*
f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-I*arcsin(c*x)*ln((I*c*f+(I*c*
x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))
+dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c
^2*f^2+g^2)^(1/2)))-dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2
)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2))))*d*(c^2*f^2-g^2))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{gx+f}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fric
as")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{f+gx}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/(g*x+f),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="maxi
ma")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{f + gx} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{f + gx} dx = \int \frac{(a + b \operatorname{asin}(c\,x)) \,(d - c^2\,d\,x^2)^{3/2}}{f + g\,x} dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

3.40 $\int (f+gx)^3 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx)) \, dx$

Optimal result

Integrand size = 31, antiderivative size = 1281

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} + \frac{2bd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} - \frac{25bcd^2f^3x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{15bd^2fg^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{bd^2g^3x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}} + \frac{5bc^3d^2f^3x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}}{256\sqrt{1-c^2x^2}} + \frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bcd^2g^3x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}} + \frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{19bc^3d^2g^3x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}} - \frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} - \frac{bc^5d^2g^3x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}} + \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{16}d^2fg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{3}{8}d^2fg^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} - \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} + \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4} + \frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 5/16*d^2*f^3*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-15/128*d^2*f*g^2*x*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+5/16*d^2*f*g^2*x^3*(-c^2*x^2+1)*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/8*d^2*f*g^2*x^3*(-c^2*x^2+1)^2*(a+b*
arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/7*d^2*f^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(
c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/63*b*d^2*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-
c^2*x^2+1)^(1/2)-25/96*b*c*d^2*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)+1/189*b*d^2*g^3*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+5/96*b*c^
3*d^2*f^3*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/21*b*c*d^2*g^3*x^5*
```

```
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+19/441*b*c^3*d^2*g^3*x^7*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/81*b*c^5*d^2*g^3*x^9*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+5/32*d^2*f^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c
/(-c^2*x^2+1)^(1/2)+15/256*d^2*f*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/
2)/b/c^3/(-c^2*x^2+1)^(1/2)+9/35*b*c^3*d^2*f^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+17/96*b*c^3*d^2*f*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)-3/49*b*c^5*d^2*f^2*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3
/64*b*c^5*d^2*f*g^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/7*b*d^2*f
^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+15/256*b*d^2*f*g^2*x^2*(-c
^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/7*b*c*d^2*f^2*g*x^3*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)-59/256*b*c*d^2*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+1/36*b*d^2*f^3*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+15
/64*d^2*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f^3*x*(-c
^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f^3*x*(-c^2*x^2+1)
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/7*d^2*g^3*(-c^2*x^2+1)^3*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/9*d^2*g^3*(-c^2*x^2+1)^4*(a+b*arcsin
(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 1281, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.581$, Rules used = {4861, 4847, 4743, 4741, 4737, 30, 14, 267, 4767, 200, 4787, 4783, 4795, 272, 45,

4779, 12, 380}

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{bc^5d^2g^3\sqrt{d-c^2dx^2}x^9}{81\sqrt{1-c^2x^2}}-\frac{3bc^5d^2fg^2\sqrt{d-c^2dx^2}x^8}{64\sqrt{1-c^2x^2}}$$
$$+\frac{19bc^3d^2g^3\sqrt{d-c^2dx^2}x^7}{441\sqrt{1-c^2x^2}}-\frac{3bc^5d^2f^2g\sqrt{d-c^2dx^2}x^7}{49\sqrt{1-c^2x^2}}$$
$$+\frac{17bc^3d^2fg^2\sqrt{d-c^2dx^2}x^6}{96\sqrt{1-c^2x^2}}-\frac{bcd^2g^3\sqrt{d-c^2dx^2}x^5}{21\sqrt{1-c^2x^2}}$$
$$+\frac{9bc^3d^2f^2g\sqrt{d-c^2dx^2}x^5}{35\sqrt{1-c^2x^2}}+\frac{5bc^3d^2f^3\sqrt{d-c^2dx^2}x^4}{96\sqrt{1-c^2x^2}}$$
$$-\frac{59bcd^2fg^2\sqrt{d-c^2dx^2}x^4}{256\sqrt{1-c^2x^2}}+\frac{15}{64}d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3$$
$$+\frac{3}{8}d^2fg^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3$$
$$+\frac{5}{16}d^2fg^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3$$
$$+\frac{bd^2g^3\sqrt{d-c^2dx^2}x^3}{189c\sqrt{1-c^2x^2}}-\frac{3bcd^2f^2g\sqrt{d-c^2dx^2}x^3}{7\sqrt{1-c^2x^2}}$$
$$-\frac{25bcd^2f^3\sqrt{d-c^2dx^2}x^2}{96\sqrt{1-c^2x^2}}+\frac{15bd^2fg^2\sqrt{d-c^2dx^2}x^2}{256c\sqrt{1-c^2x^2}}$$
$$+\frac{5}{16}d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x$$
$$-\frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{128c^2}$$
$$+\frac{1}{6}d^2f^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x$$
$$+\frac{5}{24}d^2f^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x+\frac{2bd^2g^3\sqrt{d-c^2dx^2}x}{63c^3\sqrt{1-c^2x^2}}$$
$$+\frac{3bd^2f^2g\sqrt{d-c^2dx^2}x}{7c\sqrt{1-c^2x^2}}+\frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}$$
$$+\frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$
$$+\frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4}$$
$$-\frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$-\frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}$$
$$+\frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$

```
[In] Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d^2*f^2*g*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) + (2*b*d^2*g^
3*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) - (25*b*c*d^2*f^3*x^2*S
qrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (15*b*d^2*f*g^2*x^2*Sqrt[d - c
^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (3*b*c*d^2*f^2*g*x^3*Sqrt[d - c^2*d*
x^2])/(7*Sqrt[1 - c^2*x^2]) + (b*d^2*g^3*x^3*Sqrt[d - c^2*d*x^2])/(189*c*Sq
rt[1 - c^2*x^2]) + (5*b*c^3*d^2*f^3*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c
^2*x^2]) - (59*b*c*d^2*f*g^2*x^4*Sqrt[d - c^2*d*x^2])/(256*Sqrt[1 - c^2*x^2
]) + (9*b*c^3*d^2*f^2*g*x^5*Sqrt[d - c^2*d*x^2])/(35*Sqrt[1 - c^2*x^2]) - (
b*c*d^2*g^3*x^5*Sqrt[d - c^2*d*x^2])/(21*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2
*f*g^2*x^6*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*f^2*g
*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]) + (19*b*c^3*d^2*g^3*x^7*Sq
rt[d - c^2*d*x^2])/(441*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*f*g^2*x^8*Sqrt[d
- c^2*d*x^2])/(64*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*g^3*x^9*Sqrt[d - c^2*d*x^
2])/(81*Sqrt[1 - c^2*x^2]) + (b*d^2*f^3*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*
x^2])/(36*c) + (5*d^2*f^3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/16 - (
15*d^2*f*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^2) + (15*d^2
*f*g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/64 + (5*d^2*f^3*x*(1 -
c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/24 + (5*d^2*f*g^2*x^3*(1
- c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/16 + (d^2*f^3*x*(1 - c^
2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/6 + (3*d^2*f*g^2*x^3*(1 -
 c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 - (3*d^2*f^2*g*(1 -
c^2*x^2)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c^2) - (d^2*g^3*(1 -
 c^2*x^2)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c^4) + (d^2*g^3*(1
- c^2*x^2)^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*c^4) + (5*d^2*f^3*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2]) + (15
*d^2*f*g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^3*Sqrt[1 - c
^2*x^2])
```

<u>Rule 12</u>

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

<u>Rule 14</u>

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

<u>Rule 30</u>

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

<u>Rule 45</u>

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))+3f^2gx(1-c^2x^2)^{5/2}(a+b\arcsin(cx))+3f\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2f^3\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3d^2f^2g\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(d^2g^3\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{6}d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{3}{8}d^2fg^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&- \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+ \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4} \\
&+ \frac{\left(5d^2f^3\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{6\sqrt{1-c^2x^2}} \\
&- \frac{\left(bcd^2f^3\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^2\,dx}{6\sqrt{1-c^2x^2}} + \frac{\left(3bd^2f^2g\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^3\,dx}{7c\sqrt{1-c^2x^2}} \\
&+ \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}} \\
&- \frac{\left(3bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^2\,dx}{8\sqrt{1-c^2x^2}} \\
&- \frac{\left(bcd^2g^3\sqrt{d-c^2dx^2}\right)\int\frac{(-2-7c^2x^2)(1-c^2x^2)^3}{63c^4}\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{24}d^2f^3x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{5}{16}d^2fg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{1}{6}d^2f^3x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{3}{8}d^2fg^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$- \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}$$
$$- \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$+ \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4}$$
$$+ \frac{\left(5d^2f^3\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}}$$
$$- \frac{\left(5bcd^2f^3\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,dx}{24\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(3bd^2f^2g\sqrt{d-c^2dx^2}\right)\int(1-3c^2x^2+3c^4x^4-c^6x^6)\,dx}{7c\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3bcd^2fg^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x(1-c^2x)^2\,dx,x,x^2\right)}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(5bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)\,dx}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(bd^2g^3\sqrt{d-c^2dx^2}\right)\int(-2-7c^2x^2)(1-c^2x^2)^3\,dx}{63c^3\sqrt{1-c^2x^2}}$$

$$= \frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$
$$- \frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$
$$+ \frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{5}{24}d^2f^3x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{5}{16}d^2fg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{1}{6}d^2f^3x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{3}{8}d^2fg^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$- \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}$$
$$- \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$+ \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4}$$
$$+ \frac{\left(5d^2f^3\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f^3\sqrt{d-c^2dx^2}\right)\int (x-c^2x^3)\,dx}{24\sqrt{1-c^2x^2}}$$
$$- \frac{\left(5bcd^2f^3\sqrt{d-c^2dx^2}\right)\int x\,dx}{16\sqrt{1-c^2x^2}} + \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3bcd^2fg^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int (x-2c^2x^2+c^4x^3)\,dx, x, x^2\right)}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(15bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int (x^3-c^2x^5)\,dx}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(bd^2g^3\sqrt{d-c^2dx^2}\right)\int (-2-c^2x^2+15c^4x^4-19c^6x^6+7c^8x^8)\,dx}{63c^3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} + \frac{2bd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} - \frac{25bcd^2f^3x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{bd^2g^3x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}} + \frac{5bc^3d^2f^3x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} \\
&\quad - \frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}}{256\sqrt{1-c^2x^2}} + \frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bcd^2g^3x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}} \\
&\quad + \frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&\quad + \frac{19bc^3d^2g^3x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}} - \frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2g^3x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}} + \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} \\
&\quad + \frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} \\
&\quad + \frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{5}{24}d^2f^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{5}{16}d^2fg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{3}{8}d^2fg^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&\quad - \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&\quad + \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4} \\
&\quad + \frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(15bd^2fg^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{128c\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} + \frac{2bd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} - \frac{25bcd^2f^3x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}$$
$$+ \frac{15bd^2fg^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{bd^2g^3x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}$$
$$+ \frac{5bc^3d^2f^3x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}}{256\sqrt{1-c^2x^2}} + \frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$
$$- \frac{bcd^2g^3x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}} + \frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}$$
$$+ \frac{19bc^3d^2g^3x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}} - \frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}$$
$$- \frac{bc^5d^2g^3x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}} + \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$
$$+ \frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}$$
$$+ \frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{5}{24}d^2f^3x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{5}{16}d^2fg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{1}{6}d^2f^3x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+ \frac{3}{8}d^2fg^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$- \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}$$
$$- \frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$+ \frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4}$$
$$+ \frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 587, normalized size of antiderivative = 0.46

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(99225a^2(8c^3f^3+3cfg^2)+630ab\sqrt{1-c^2x^2}(-256g^3-c^2g(3456f^2+945fg\right.}{}$$

```
[In] Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(99225*a^2*(8*c^3*f^3 + 3*c*f*g^2) + 630*a*b*Sqrt[
1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*x^2) + 16*c^
8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*(546*
f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3 + 172
8*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) + b^2*c*x*(161280*g^3 + 105*c^2*
g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) - 945*c^4*x*(1848*f^3 + 2304*f^2*g
*x + 1239*f*g^2*x^2 + 256*g^3*x^3) + 72*c^6*x^3*(9555*f^3 + 18144*f^2*g*x +
 12495*f*g^2*x^2 + 3040*g^3*x^3) - 20*c^8*x^5*(7056*f^3 + 15552*f^2*g*x + 1
1907*f*g^2*x^2 + 3136*g^3*x^3)) + 630*b*(315*a*(8*c^3*f^3 + 3*c*f*g^2) + b*
Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*x^2) +
16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*
(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3
+ 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)))*ArcSin[c*x] + 99225*b^2*c*
f*(8*c^2*f^2 + 3*g^2)*ArcSin[c*x]^2))/(5080320*b*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.77 (sec) , antiderivative size = 2903, normalized size of antiderivative = 2.27

method	result	size
default	Expression too large to display	2903
parts	Expression too large to display	2903

```
[In] int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^3*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*
(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2)))))+g^3*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-
c^2*d*x^2+d)^(7/2))+3*f*g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1/6
*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^
2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^
```

(1/2))))))-3/7*f^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(8*c^2*f^2+3*g^2)
d^2+1/41472(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*
x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x
^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3
*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1
)+3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2
*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(4*I*c^2*f^2+28*
arcsin(c*x)*c^2*f^2-I*g^2-7*arcsin(c*x)*g^2)*d^2/c^4/(c^2*x^2-1)-1/9216*(-d
*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(58*I*c^2*f^2+19
2*arcsin(c*x)*c^2*f^2-39*I*g^2-36*arcsin(c*x)*g^2)*cos(5*arcsin(c*x))*d^2/c
^3/(c^2*x^2-1)-3/640*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c
^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^
2*x^2+1)^(1/2)*x*c-1)*f^2*g*(I+5*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/1152*(-
d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*
I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(27*I*c^2*f^2+81*arcsin(c*x)*c^2*f^2+2*I*g^2+
6*arcsin(c*x)*g^2)*d^2/c^4/(c^2*x^2-1)+3/16384*(-d*(c^2*x^2-1))^(1/2)*(-128
I(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-
320*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^
(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*f*g^2*(8*arcsin(c*x)+I
)*d^2/c^3/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^
(1/2)*x*c-1)*g*(10*I*c^2*f^2+10*arcsin(c*x)*c^2*f^2+I*g^2+arcsin(c*x)*g^2)*
d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+
c^2*x^2-1)*g*(10*arcsin(c*x)*c^2*f^2-10*I*c^2*f^2+arcsin(c*x)*g^2-I*g^2)*d^
2/c^4/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)
^(1/2)-I)*f*(22*I*c^2*f^2+32*arcsin(c*x)*c^2*f^2+3*I*g^2+12*arcsin(c*x)*g^2
)*cos(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*I
*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+
1)*g*(81*arcsin(c*x)*c^2*f^2-27*I*c^2*f^2+6*arcsin(c*x)*g^2-2*I*g^2)*d^2/c^
4/(c^2*x^2-1)-3/640*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)
+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/
2)*x*c+13*c^2*x^2-1)*f^2*g*(-I+5*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+3/25088*(
-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c
^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4
*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*g*(-4*I*c^2*f^2+28*arcsin(c*x
)*c^2*f^2+I*g^2-7*arcsin(c*x)*g^2)*d^2/c^4/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-
1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1
/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x
^2+1)^(1/2)-6*c*x)*f*(I*c^2*f^2+6*arcsin(c*x)*c^2*f^2-3*I*g^2-18*arcsin(c*x
)*g^2)*d^2/c^3/(c^2*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+
1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8
+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*
c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*g^3*(-I+9*arcsin(c
*x))*d^2/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/

```
2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-5*I*c^2*f^2+10*arcsin(
c*x)*c^2*f^2-I*g^2+2*arcsin(c*x)*g^2)*d^2/c^3/(c^2*x^2-1)+5/9216*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(10*I*c^2*f^2+48*arcsin
(c*x)*c^2*f^2-3*I*g^2-36*arcsin(c*x)*g^2)*sin(5*arcsin(c*x))*d^2/c^3/(c^2*x
^2-1)+3/16384*(-d*(c^2*x^2-1))^(1/2)*(128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*
c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(1/
2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x
^2+1)^(1/2)+8*c*x)*f*g^2*(-I+8*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+3/1024*(-d*
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(18*I*c^2*f^2+48*
arcsin(c*x)*c^2*f^2+5*I*g^2+4*arcsin(c*x)*g^2)*sin(3*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

```
[Out] integral((a*c^4*d^2*g^3*x^7 + 3*a*c^4*d^2*f*g^2*x^6 + 3*a*d^2*f^2*g*x + a*d
^2*f^3 + (3*a*c^4*d^2*f^2*g - 2*a*c^2*d^2*g^3)*x^5 + (a*c^4*d^2*f^3 - 6*a*c
^2*d^2*f*g^2)*x^4 - (6*a*c^2*d^2*f^2*g - a*d^2*g^3)*x^3 - (2*a*c^2*d^2*f^3
- 3*a*d^2*f*g^2)*x^2 + (b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*b*d^2
*f^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b*c^4*d
^2*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^3 - (2*
b*c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^3 + 1/128*(8*(-c^2*d*
x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*x^2
 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*arcsin
(c*x)/c^3)*a*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d
*x^2 + d)^(7/2)/(c^4*d))*a*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a*f^2*g/(c^2*d)
 + sqrt(d)*integrate((b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*b*d^2*f
^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b*c^4*d^2
*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^3 - (2*b*
c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d - c^2 d x^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.41 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 940

$$\begin{aligned}
\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx &= \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} \\
&- \frac{25bcd^2f^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} \\
&+ \frac{5bc^3d^2f^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} \\
&+ \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&- \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} \\
&+ \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} \\
&+ \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{2d^2fg\left(1-c^2x^2\right)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&+ \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 1/36*b*d^2*f^2*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f^2*x*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-5/128*d^2*g^2*x*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)/c^2+5/64*d^2*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
+5/24*d^2*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/48*d^
2*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f^2*x
*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/8*d^2*g^2*x^3*(-c^
2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-2/7*d^2*f*g*(-c^2*x^2+1)^
3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/7*b*d^2*f*g*x*(-c^2*d*x^2+d)
^(1/2)/c/(-c^2*x^2+1)^(1/2)-25/96*b*c*d^2*f^2*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)+5/256*b*d^2*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2
)-2/7*b*c*d^2*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*c^3*d^
2*f^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-59/768*b*c*d^2*g^2*x^4*(-
c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*f*g*x^5*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)+17/288*b*c^3*d^2*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*f*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)-1/64*b*c^5*d^2*g^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/32*d^2
*f^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+5/256*
d^2*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 940, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.484$, Rules

used = {4861, 4847, 4743, 4741, 4737, 30, 14, 267, 4767, 200, 4787, 4783, 4795, 272, 45}

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = -\frac{bc^5d^2g^2\sqrt{d-c^2dx^2}x^8}{64\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fg\sqrt{d-c^2dx^2}x^7}{49\sqrt{1-c^2x^2}} + \frac{17bc^3d^2g^2\sqrt{d-c^2dx^2}x^6}{288\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fg\sqrt{d-c^2dx^2}x^5}{35\sqrt{1-c^2x^2}} + \frac{5bc^3d^2f^2\sqrt{d-c^2dx^2}x^4}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2\sqrt{d-c^2dx^2}x^4}{768\sqrt{1-c^2x^2}} + \frac{5}{64}d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3 + \frac{1}{8}d^2g^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3 + \frac{5}{48}d^2g^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3 - \frac{2bcd^2fg\sqrt{d-c^2dx^2}x^3}{7\sqrt{1-c^2x^2}} - \frac{25bcd^2f^2\sqrt{d-c^2dx^2}x^2}{96\sqrt{1-c^2x^2}} + \frac{5bd^2g^2\sqrt{d-c^2dx^2}x^2}{256c\sqrt{1-c^2x^2}} + \frac{5}{16}d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x - \frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{128c^2} + \frac{1}{6}d^2f^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x + \frac{5}{24}d^2f^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x + \frac{2bd^2fg\sqrt{d-c^2dx^2}x}{7c\sqrt{1-c^2x^2}} + \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}} - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$

```
[In] Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*f*g*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) - (25*b*c*d^2*f
^2*x^2*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (5*b*d^2*g^2*x^2*Sqrt[
d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*f*g*x^3*Sqrt[d - c^2
*d*x^2])/(7*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*f^2*x^4*Sqrt[d - c^2*d*x^2])/
(96*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*g^2*x^4*Sqrt[d - c^2*d*x^2])/(768*Sqrt
[1 - c^2*x^2]) + (6*b*c^3*d^2*f*g*x^5*Sqrt[d - c^2*d*x^2])/(35*Sqrt[1 - c^2
*x^2]) + (17*b*c^3*d^2*g^2*x^6*Sqrt[d - c^2*d*x^2])/(288*Sqrt[1 - c^2*x^2])
 - (2*b*c^5*d^2*f*g*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]) - (b*c^
5*d^2*g^2*x^8*Sqrt[d - c^2*d*x^2])/(64*Sqrt[1 - c^2*x^2]) + (b*d^2*f^2*(1 -
 c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*f^2*x*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/16 - (5*d^2*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/(128*c^2) + (5*d^2*g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/64 + (5*d^2*f^2*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
24 + (5*d^2*g^2*x^3*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
48 + (d^2*f^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/6
+ (d^2*g^2*x^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 -
 (2*d^2*f*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c^2
) + (5*d^2*f^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 -
```

```
c^2*x^2]) + (5*d^2*g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^
3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))+2fgx(1-c^2x^2)^{5/2}(a+b\arcsin(cx))+g^2x\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2f^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2d^2fg\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(d^2g^2\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&\quad + \frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{6\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2f^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^2\,dx}{6\sqrt{1-c^2x^2}} + \frac{\left(2bd^2fg\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^3\,dx}{7c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2g^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^2\,dx}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&\quad + \frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2f^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,dx}{24\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2bd^2fg\sqrt{d-c^2dx^2}\right)\int\left(1-3c^2x^2+3c^4x^4-c^6x^6\right)dx}{7c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2g^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int x(1-c^2x)^2\,dx,x,x^2\right)}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2g^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)\,dx}{48\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{48}d^2g^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2f^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{8}d^2g^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f^2\sqrt{d-c^2dx^2}\right)\int\left(x-c^2x^3\right)\,dx}{24\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{16\sqrt{1-c^2x^2}} + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(bcd^2g^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(x-2c^2x^2+c^4x^3\right)\,dx,x,x^2\right)}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2g^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2g^2\sqrt{d-c^2dx^2}\right)\int\left(x^3-c^2x^5\right)\,dx}{48\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{25bcd^2f^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{5bc^3d^2f^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} \\
&\quad + \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&\quad + \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5bd^2g^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{128c\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{25bcd^2f^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{5bc^3d^2f^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} + \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{48}d^2g^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2f^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{8}d^2g^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 390, normalized size of antiderivative = 0.41

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(11025a^2(8c^2f^2+g^2)+b^2c^2x(-1960c^2f^2x(99-39c^2x^2+8c^4x^4)-4608fg$$

```
[In] Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*(8*c^2*f^2 + g^2) + b^2*c^2*x*(-1960*c^
2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 4608*f*g*(-35 + 35*c^2*x^2 - 21*c^4
*x^4 + 5*c^6*x^6) - 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4 + 36*c^6*x^6
)) + 210*a*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(
33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 4
8*c^6*x^6)) + 210*b*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*(768*f
*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*
(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x] + 11025*b^2*(8
*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(564480*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 2090, normalized size of antiderivative = 2.22

method	result	size
default	Expression too large to display	2090
parts	Expression too large to display	2090

```
[In] int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*
(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1/6*x*
(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d
*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/
2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(8*c^2*f^2+g^2)*d^2+1/31
36*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)
^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(I+7*arcsin(c*x))*d^2
/c^2/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^
6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+
1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*arcsin(c*x)*c^2*
f^2+I*c^2*f^2-6*arcsin(c*x)*g^2-I*g^2)*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^2*
x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(22*I*c^2*f^2+32*arcsin(
c*x)*c^2*f^2+I*g^2+4*arcsin(c*x)*g^2)*cos(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1
)-5/64*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arc
sin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/64*(-d*(c^2
*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(
1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/160*(-d*
(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(3*I+5*arcsin(c
*x))*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/16384*(-d*(c^2*x^2-1))^(1/2)*
(128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*
c^6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2
+1)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*g^2*(-I+8*arcsin(c
*x))*d^2/c^3/(c^2*x^2-1)-1/3920*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2
)*x*c+c^2*x^2-1)*f*g*(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(c^2*
x^2-1)-1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(
58*I*c^2*f^2+192*arcsin(c*x)*c^2*f^2-13*I*g^2-12*arcsin(c*x)*g^2)*cos(5*arc
sin(c*x))*d^2/c^3/(c^2*x^2-1)-3/7840*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*
(-c^2*x^2+1)^(1/2)-I)*f*g*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^2/(
c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
```

```
1)*(10*I*c^2*f^2+48*arcsin(c*x)*c^2*f^2-I*g^2-12*arcsin(c*x)*g^2)*sin(5*arc
sin(c*x))*d^2/c^3/(c^2*x^2-1)-1/80*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(
1/2)*x*c+c^2*x^2-1)*f*g*(I+5*arcsin(c*x))*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x
^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^
3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(30*arcsin(c*x)*c^2*f^2+2*arcsin(c*x)*g^2-15*
I*c^2*f^2-I*g^2)*d^2/c^3/(c^2*x^2-1)+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I
*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-32
0*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1
/2)*c^2*x^2-88*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*g^2*(8*arcsin(c*x)+I)*d^
2/c^3/(c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c
^2*x^2-1)*(54*I*c^2*f^2+144*arcsin(c*x)*c^2*f^2+5*I*g^2+4*arcsin(c*x)*g^2)*
sin(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

```
[Out] integral((a*c^4*d^2*g^2*x^6 + 2*a*c^4*d^2*f*g*x^5 - 4*a*c^2*d^2*f*g*x^3 + 2
*a*d^2*f*g*x + a*d^2*f^2 + (a*c^4*d^2*f^2 - 2*a*c^2*d^2*g^2)*x^4 - (2*a*c^2
*d^2*f^2 - a*d^2*g^2)*x^2 + (b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4*b*
c^2*d^2*f*g*x^3 + 2*b*d^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*d^2*
g^2)*x^4 - (2*b*c^2*d^2*f^2 - b*d^2*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2
+ d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^2 (b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^2 + 1/384*(8*(-c^2*d*
x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*x^2
 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*arcsin
(c*x)/c^3)*a*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a*f*g/(c^2*d) + sqrt(d)*integ
rate((b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4*b*c^2*d^2*f*g*x^3 + 2*b*d
^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*d^2*g^2)*x^4 - (2*b*c^2*d^2
*f^2 - b*d^2*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.42 $\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 517

$$\begin{aligned}\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx &= \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}\\ &-\frac{25bcd^2fx^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}-\frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}\\ &+\frac{5bc^3d^2fx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}\\ &+\frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\ &+\frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\ &+\frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\ &-\frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}\\ &+\frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 1/36*b*d^2*f*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f*x*(a+b*ar
csin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*
x^2+d)^(1/2)-1/7*d^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)/c^2+1/7*b*d^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-25/96*b*c*d^2
*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/7*b*c*d^2*g*x^3*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*c^3*d^2*f*x^4*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+3/35*b*c^3*d^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)-1/49*b*c^5*d^2*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/32*d^2*f*(
a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 517, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {4861, 4847, 4743, 4741, 4737, 30, 14, 267, 4767, 200}

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} - \frac{25bcd^2fx^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} - \frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{5bc^3d^2fx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d^2*g*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) - (25*b*c*d^2*f*x^2
*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) - (b*c*d^2*g*x^3*Sqrt[d - c^2*
d*x^2])/(7*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*f*x^4*Sqrt[d - c^2*d*x^2])/(96
*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*g*x^5*Sqrt[d - c^2*d*x^2])/(35*Sqrt[1 -
c^2*x^2]) - (b*c^5*d^2*g*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]) +
(b*d^2*f*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*f*x*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/16 + (5*d^2*f*x*(1 - c^2*x^2)*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/24 + (d^2*f*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/6 - (d^2*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]))/(7*c^2) + (5*d^2*f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+gx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\right)\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2f\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(d^2g\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{d^2g\left(1-c^2x^2\right)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{\left(5d^2f\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{6\sqrt{1-c^2x^2}} - \frac{\left(bcd^2f\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^2\,dx}{6\sqrt{1-c^2x^2}} + \frac{\left(bd^2g\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^3\,dx}{7c\sqrt{1-c^2x^2}}$$

$$= \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{\left(5d^2f\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,dx}{24\sqrt{1-c^2x^2}} + \frac{\left(bd^2g\sqrt{d-c^2dx^2}\right)\int(1-3c^2x^2+3c^4x^4-c^6x^6)\,dx}{7c\sqrt{1-c^2x^2}}$$

$$= \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{\left(5d^2f\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f\sqrt{d-c^2dx^2}\right)\int(x-c^2x^3)\,dx}{24\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f\sqrt{d-c^2dx^2}\right)\int x\,dx}{16\sqrt{1-c^2x^2}}$$

$$= \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{25bcd^2fx^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} + \frac{5bc^3d^2fx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}d^2fx(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} + \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.49

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(11025a^2cf+210ab\sqrt{1-c^2x^2}\left(48g(-1+c^2x^2)^3+7c^2fx(33-26c^2x^2+\right.\right.}{}$$

```
[In] Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f + 210*a*b*Sqrt[1 - c^2*x^2]*(48*g*(
-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*x*(-245*
c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 288*g*(-35 + 35*c^2*x^2 - 21*c^4*x^
4 + 5*c^6*x^6)) + 210*b*(105*a*c*f + b*Sqrt[1 - c^2*x^2]*(48*g*(-1 + c^2*x^
2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 11025*b^2*c*
f*ArcSin[c*x]^2))/(70560*b*c^2*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 1423, normalized size of antiderivative = 2.75

method	result	size
default	Expression too large to display	1423
parts	Expression too large to display	1423

```
[In] int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*f*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a*f*d
^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a*f*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))-1/7*a*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b*(-5/32*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f*d^2+1/6272*
(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1
/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+
1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+7*arcsin(c*x))*d^2/c^2/
(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6
+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1
/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*(I+6*arcsin(c*x))*d^2/
c/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*
c-1)*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+15/
256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^
2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d^2/c/(c^2*x^2-1)+1/128*(-d*(c^2
*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(
1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(
c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(11*I+70*arcsin(c*
x))*cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(
I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x
))*d^2/c^2/(c^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x
^2+1)^(1/2)-I)*f*(29*I+96*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)
+5/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(5*I+
24*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/160*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(I+5*arcsin(c*x))*cos(4*arcsi
n(c*x))*d^2/c^2/(c^2*x^2-1)-1/320*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c
^2*x^2+1)^(1/2)-I)*g*(3*I+5*arcsin(c*x))*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^
2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(1
1*I+16*arcsin(c*x))*cos(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+9/512*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(3*I+8*arcsin(c*x))*sin(3
*arcsin(c*x))*d^2/c/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fric
as")
```

```
[Out] integral((a*c^4*d^2*g*x^5 + a*c^4*d^2*f*x^4 - 2*a*c^2*d^2*g*x^3 - 2*a*c^2*d
^2*f*x^2 + a*d^2*g*x + a*d^2*f + (b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x^4 - 2*b*c
^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

```
[In] integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxi
ma")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f - 1/7*(-c^2*d*x^2 + d
)^(7/2)*a*g/(c^2*d) + sqrt(d)*integrate((b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x^4
- 2*b*c^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*sqrt(c*x + 1
)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac
")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.43 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1648

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}$$
$$+\frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}}+\frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}}$$
$$-\frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}}-\frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}}+\frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}}$$
$$-\frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}}+\frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}$$
$$-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}}+\frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}$$
$$+\frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2}$$
$$-\frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4}$$
$$-\frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2}$$
$$-\frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g}$$
$$-\frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3}$$
$$+\frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g}$$
$$-\frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}}$$
$$-\frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}}$$
$$+\frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}}$$
$$+\frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}}$$
$$+\frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)}$$
$$-\frac{ad^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{ibd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$ibd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)$$

```
[Out] -1/3*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g+1/5*d^2*(-c^
2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g-a*d^2*(c^2*f^2-g^2)^(5/
2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d
)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+b*d^2*(c^2*f^2-g^2)^(5/2)*polylog(2,I*(I*c*x
+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/
(-c^2*x^2+1)^(1/2)-b*d^2*(c^2*f^2-g^2)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1
)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)
^(1/2)+I*b*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1
/2)-b*c*d^2*(c^2*f^2-g^2)^2*x*(-c^2*d*x^2+d)^(1/2)/g^5/(-c^2*x^2+1)^(1/2)+1
/3*b*c*d^2*(c^2*f^2-2*g^2)*x*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/
9*b*c^3*d^2*(c^2*f^2-2*g^2)*x^3*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)
+1/16*b*c^5*d^2*f*x^4*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-1/16*c*d^
2*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/g^2/(-c^2*x^2+1)^(1/2)-1/2*c
^2*d^2*f*(c^2*f^2-2*g^2)*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^4-1/16*
b*c^3*d^2*f*x^2*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+a*d^2*(c^2*f^2-
g^2)^2*(-c^2*d*x^2+d)^(1/2)/g^5+b*d^2*(c^2*f^2-g^2)^2*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/g^5+2/15*b*c*d^2*x*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/
45*b*c^3*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-1/25*b*c^5*d^2*x
^5*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/8*c^2*d^2*f*x*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/g^2-1/4*c^4*d^2*f*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^
2+d)^(1/2)/g^2-1/3*d^2*(c^2*f^2-2*g^2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)/g^3-1/4*c*d^2*f*(c^2*f^2-2*g^2)*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/b/g^4/(-c^2*x^2+1)^(1/2)+1/2*c*d^2*(c^2*f^2-g^2)^2*x*(a+b*arc
sin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/g^5/(-c^2*x^2+1)^(1/2)+1/2*d^2*(c^2*f^2-
g^2)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/g^6/(g*x+f)/(-c^2*x^2+1
)^(1/2)+1/2*d^2*(c^2*f^2-g^2)^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*(-c^
2*d*x^2+d)^(1/2)/b/c/g^4/(g*x+f)+1/4*b*c^3*d^2*f*(c^2*f^2-2*g^2)*x^2*(-c^2*
d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-I*b*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*
x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x
^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 1.79 (sec) , antiderivative size = 1648, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.903$, Rules used = {4861, 4851, 4741, 4737, 30, 4767, 4783, 4795, 272, 45, 4779, 12, 4849, 697, 4841,

6874, 739, 210, 1668, 4883, 4881, 8, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = -\frac{bd^2x^5\sqrt{d-c^2dx^2}c^5}{25g\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2fx^4\sqrt{d-c^2dx^2}c^5}{16g^2\sqrt{1-c^2x^2}} - \frac{d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^4}{4g^2}$$
$$-\frac{bd^2(c^2f^2-2g^2)x^3\sqrt{d-c^2dx^2}c^3}{9g^3\sqrt{1-c^2x^2}} + \frac{bd^2x^3\sqrt{d-c^2dx^2}c^3}{45g\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2f(c^2f^2-2g^2)x^2\sqrt{d-c^2dx^2}c^3}{4g^4\sqrt{1-c^2x^2}} - \frac{bd^2fx^2\sqrt{d-c^2dx^2}c^3}{16g^2\sqrt{1-c^2x^2}}$$
$$-\frac{d^2f(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^2}{2g^4}$$
$$+\frac{d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^2}{8g^2}$$
$$-\frac{d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c}{4bg^4\sqrt{1-c^2x^2}}$$
$$+\frac{d^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c}{2bg^5\sqrt{1-c^2x^2}}$$
$$-\frac{d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c}{16bg^2\sqrt{1-c^2x^2}}$$
$$-\frac{bd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}c}{g^5\sqrt{1-c^2x^2}} + \frac{bd^2(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}c}{3g^3\sqrt{1-c^2x^2}}$$
$$+\frac{2bd^2x\sqrt{d-c^2dx^2}c}{15g\sqrt{1-c^2x^2}} + \frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}$$
$$+\frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g}$$
$$-\frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3}$$
$$-\frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g}$$
$$-\frac{ad^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{ibd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$-\frac{ibd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$-\frac{bd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] (a*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2])/g^5 + (2*b*c*d^2*x*Sqrt[d - c
^2*d*x^2])/(15*g*Sqrt[1 - c^2*x^2]) + (b*c*d^2*(c^2*f^2 - 2*g^2)*x*Sqrt[d -
 c^2*d*x^2])/(3*g^3*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(c^2*f^2 - g^2)^2*x*Sqrt[
d - c^2*d*x^2])/(g^5*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*f*x^2*Sqrt[d - c^2*d*x
^2])/(16*g^2*Sqrt[1 - c^2*x^2]) + (b*c^3*d^2*f*(c^2*f^2 - 2*g^2)*x^2*Sqrt[d
 - c^2*d*x^2])/(4*g^4*Sqrt[1 - c^2*x^2]) + (b*c^3*d^2*x^3*Sqrt[d - c^2*d*x^
2])/(45*g*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*(c^2*f^2 - 2*g^2)*x^3*Sqrt[d - c^
2*d*x^2])/(9*g^3*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2*f*x^4*Sqrt[d - c^2*d*x^2])
/(16*g^2*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^5*Sqrt[d - c^2*d*x^2])/(25*g*Sqr
t[1 - c^2*x^2]) + (b*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])
/g^5 + (c^2*d^2*f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*g^2) - (c^2
*d^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*g^4)
 - (c^4*d^2*f*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(4*g^2) - (d^2*(
1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*g) - (d^2*(c^2*f^2
 - 2*g^2)*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*g^3) +
(d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*g) - (c*d^
2*f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*g^2*Sqrt[1 - c^2*x^2])
 - (c*d^2*f*(c^2*f^2 - 2*g^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4
*b*g^4*Sqrt[1 - c^2*x^2]) + (c*d^2*(c^2*f^2 - g^2)^2*x*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x])^2)/(2*b*g^5*Sqrt[1 - c^2*x^2]) + (d^2*(c^2*f^2 - g^2)^3
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*g^6*(f + g*x)*Sqrt[1 - c
^2*x^2]) + (d^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x])^2)/(2*b*c*g^4*(f + g*x)) - (a*d^2*(c^2*f^2 - g^2)^(5/2)*Sq
rt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^
2])])/(g^6*Sqrt[1 - c^2*x^2]) + (I*b*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2
*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/(g^6*Sqrt[1 - c^2*x^2]) - (I*b*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^
2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 -
g^2])])/(g^6*Sqrt[1 - c^2*x^2]) + (b*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2
*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g
^6*Sqrt[1 - c^2*x^2]) - (b*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*Po
lyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1
- c^2*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
```

```
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
```

```
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
```

```
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(-\frac{c^2f(c^2f^2-2g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^4}+\frac{c^2(c^2f^2-2g^2)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^3}-\frac{c^4fx^2\sqrt{1-c^2}}{}\right.}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(c^4d^2f\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(c^4d^2\sqrt{d-c^2dx^2}\right)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g\sqrt{1-c^2x^2}}$$
$$-\frac{\left(c^2d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g^4\sqrt{1-c^2x^2}}$$
$$+\frac{\left(c^2d^2(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{g^3\sqrt{1-c^2x^2}}$$
$$+\frac{\left(d^2\left(c^2f^2-g^2\right)^2\sqrt{d-c^2dx^2}\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{f+gx}\,dx}{g^4\sqrt{1-c^2x^2}}$$

$$= -\frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} - \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} - \frac{\left(c^4d^2f\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4g^2\sqrt{1-c^2x^2}} + \frac{\left(bc^5d^2f\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{4g^2\sqrt{1-c^2x^2}} - \frac{\left(bc^5d^2\sqrt{d-c^2dx^2}\right)\int\frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx}{g\sqrt{1-c^2x^2}} - \frac{\left(c^2d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2g^4\sqrt{1-c^2x^2}} + \frac{\left(bc^3d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int x\,dx}{2g^4\sqrt{1-c^2x^2}} + \frac{\left(bcd^2(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)\,dx}{3g^3\sqrt{1-c^2x^2}} - \frac{\left(d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^2}{(f+gx)^2}\,dx}{2bcg^4\sqrt{1-c^2x^2}}$$

$$= \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2}$$
$$- \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4}$$
$$- \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2}$$
$$- \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g}$$
$$- \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3}$$
$$+ \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g}$$
$$- \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}}$$
$$+ \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}}$$
$$+ \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)}$$
$$- \frac{\left(c^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8g^2\sqrt{1-c^2x^2}} - \frac{\left(bc^3d^2f\sqrt{d-c^2dx^2}\right)\int x\,dx}{8g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+3c^4x^4\right)\,dx}{15g\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{g^4\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad + \frac{\left(d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\left(-\frac{a(c^2f^2-g^2+c^2fgx+c^2g^2x^2)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{b(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^4\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&- \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&- \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&- \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&- \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&- \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&- \frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&+ \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&- \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&- \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&+ \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&- \frac{\left(ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{c^2f^2-g^2+c^2fgx+c^2g^2x^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^6\sqrt{1-c^2x^2}} \\
&- \frac{\left(bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} + \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} - \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&\quad - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad - \frac{\left(ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{c^2g^2(c^2f^2-g^2)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{c^2g^8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\left(\frac{c^2gx\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{(c^2f^2-g^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} + \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} - \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&\quad - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad - \frac{\left(bc^2d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g^5\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(ad^2(cf-g)(cf+g)\,(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^6\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}+\frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}}+\frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad-\frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}+\frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}}+\frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&\quad-\frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}}+\frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} \\
&\quad+\frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}+\frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad-\frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad-\frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad-\frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad-\frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad+\frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&\quad-\frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad+\frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad+\frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad+\frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad-\frac{\left(bcd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int 1\,dx}{g^5\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(ad^2(cf-g)(cf+g)\,(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{1}{-c^2f^2+g^2-x^2}\,dx,x,\frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(bd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{x}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} + \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad - \frac{ad^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2bd^2(cf-g)(cf+g)(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}+\frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}}+\frac{bcd^2(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad -\frac{bcd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}}-\frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad +\frac{bc^3d^2f(c^2f^2-2g^2)x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}}+\frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&\quad -\frac{bc^3d^2(c^2f^2-2g^2)x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}}+\frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} \\
&\quad +\frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}+\frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad -\frac{c^2d^2f(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad -\frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad -\frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad -\frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad +\frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g}-\frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad -\frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad +\frac{cd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad +\frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad +\frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad -\frac{ad^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(2ibd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(c\right.}{g^5\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(2ibd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(c\right.}{g^5\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}+\frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}}+\frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}}\\
&-\frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}}-\frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}\\
&+\frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}}+\frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}}\\
&-\frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}}+\frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}}\\
&+\frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}+\frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2}\\
&-\frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4}\\
&-\frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2}\\
&-\frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g}\\
&-\frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3}\\
&+\frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g}-\frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}}\\
&-\frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}}\\
&+\frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}}\\
&+\frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}}\\
&+\frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)}\\
&-\frac{ad^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}}\\
&+\frac{ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}\\
&-\frac{ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}\\
&-\frac{\left(ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin\right.}{g^6\sqrt{1-c^2x^2}}\\
&+\frac{\left(ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin\right.}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} + \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&- \frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&- \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} \\
&+ \frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&- \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&- \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&- \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&- \frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&+ \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&- \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&+ \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&- \frac{ad^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&+ \frac{ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&- \frac{ibd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&- \frac{\left(bd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{g^6\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bd^2(cf-g)(cf+g)\,(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} + \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&\quad - \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&\quad + \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&\quad - \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&\quad - \frac{ad^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad + \frac{ibd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad - \frac{ibd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&\quad - \frac{bd^2(cf-g)(cf+g)(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.13 (sec) , antiderivative size = 787, normalized size of antiderivative = 0.48

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx =$$

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(-900bc^3f(c^2f^2-2g^2)\,x^2-225bc^5fg^2x^4+144bc^5g^3x^5+400bcg(c^2f^2-2g^2)\,x(-3+c^2x^2\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

```
[Out] -1/3600*(d^2*Sqrt[d - c^2*d*x^2]*(-900*b*c^3*f*(c^2*f^2 - 2*g^2)*x^2 - 225*
b*c^5*f*g^2*x^4 + 144*b*c^5*g^3*x^5 + 400*b*c*g*(c^2*f^2 - 2*g^2)*x*(-3 + c
^2*x^2) + 1800*c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]) + 900*c^4*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 720*c^4*g^3
*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 1200*g*(c^2*f^2 - 2*g^2)*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + (900*c*f*(c^2*f^2 - 2*g^2)*(a + b*ArcS
in[c*x])^2)/b + (1800*(-(c^2*f^2) + g^2)^2*(-1 + c^2*x^2)*(a + b*ArcSin[c*x
])^2)/(b*c*(f + g*x)) - 80*g^3*(6*b*c*x + b*c^3*x^3 - 6*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]) - 3*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])) + 225
*c*f*g^2*(b*c^2*x^2 - 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + (a + b*
ArcSin[c*x])^2/b) - (1800*(-(c^2*f^2) + g^2)^2*(c^2*g*x*(a + b*ArcSin[c*x])
^2 + ((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(f + g*x) - 2*b*c*(b*c*g*x - g
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*Sqrt[c^2*f^2 - g^2]*((a + b*ArcS
in[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] -
 Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - I*b*PolyLo
g[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + I*b*PolyLog[2,
(I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(b*c*g^2)))/(g^4*S
qrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.73 (sec) , antiderivative size = 2580, normalized size of antiderivative = 1.57

method	result	size
default	Expression too large to display	2580
parts	Expression too large to display	2580

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE)
```

```
[Out] a/g*(1/5*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(5/2)+c
^2*d*f/g*(-1/8*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2*c^2
```

```
*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(3/2)-3/16*(4*c^2*d^2*(c^2*f^2-g^2)/g^2
-4*c^4*d^2*f^2/g^2)/c^2/d*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f
/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(
c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))))-d*(
c^2*f^2-g^2)/g^2*(1/3*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)
/g^2)^(3/2)+c^2*d*f/g*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^
2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*
f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)))-d*(c^2*f
^2-g^2)/g^2*((-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/
2)+c^2*d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d
*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g
^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^
2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2
)^(1/2))/(x+f/g)))))+b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*arcsin(c*x)^2*f*(8*c^4*f^4-20*c^2*f^2*g^2+15*g^4)*d^2*c/g^6+1/800*
(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(I+5*arcsin(c*x))*d^2/(c^2*x^2-1)/g-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c
^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3
-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*arcsin(c*x)+I)*d^2*c/(c^2*x^2-1)/g^2+1/28
8*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2
)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(4*c^2*f^2-7*g^2)*(I+3*arcsin(c*x))*d^2/(c^
2*x^2-1)/g^3-1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2
*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(c^2*f^2-2*g^2)*(I+2*arcsin(c*x))*d^
2*c/(c^2*x^2-1)/g^4+1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/
2)*x*c-1)*(8*c^4*f^4-18*c^2*f^2*g^2+11*g^4)*(arcsin(c*x)+I)*d^2/(c^2*x^2-1)
/g^5+1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(8*c^
4*f^4-18*c^2*f^2*g^2+11*g^4)*(arcsin(c*x)-I)*d^2/(c^2*x^2-1)/g^5-1/16*(-d*(
c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^
(1/2)-2*c*x)*f*(c^2*f^2-2*g^2)*(-I+2*arcsin(c*x))*d^2*c/(c^2*x^2-1)/g^4+1/2
88*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(4*c^2*f^2-7*g^2)*(-I+3*arcsin(c*x))*d^2/(
c^2*x^2-1)/g^3-1/256*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4
+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4
*c*x)*f*(-I+4*arcsin(c*x))*d^2*c/(c^2*x^2-1)/g^2+1/800*(-d*(c^2*x^2-1))^(1/
2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*
c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*
d^2/(c^2*x^2-1)/g+I*(-c^2*f^2+g^2)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*(I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2
)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2
*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))+dilog(
(I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+
g^2)^(1/2)))-dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2)
```

```
)/(I*c*f+(-c^2*f^2+g^2)^(1/2))))*(c^4*f^4-2*c^2*f^2*g^2+g^4)*d^2/(c^2*x^2-1
)/g^6)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{gx+f}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fric
as")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}{(cx)})}{f+gx}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/(g*x+f),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="maxi
ma")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx))}{f + gx} \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx))}{f + gx} \, dx = \int \frac{(a + b \operatorname{asin}(c\,x)) \left(d - c^2\,d\,x^2\right)^{5/2}}{f + g\,x} \, dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)
```

3.44 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 450

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx &= \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2bg^3x\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}\\&+\frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}+\frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}\\&-\frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}\\&-\frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))}{3c^4\sqrt{d-c^2dx^2}}\\&-\frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}}\\&-\frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}}\\&+\frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}\\&+\frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -3*f^2*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-2/3*g^3*(-
c^2*x^2+1)*(a+b*arcsin(c*x))/c^4/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*x*(-c^2*x^2
+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-1/3*g^3*x^2*(-c^2*x^2+1)*(a+
b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+3*b*f^2*g*x*(-c^2*x^2+1)^(1/2)/c/(-
c^2*d*x^2+d)^(1/2)+2/3*b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+
3/4*b*f*g^2*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/9*b*g^3*x^3*(-c
^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/2*f^3*(a+b*arcsin(c*x))^2*(-c^2*x^
2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)+3/4*f*g^2*(a+b*arcsin(c*x))^2*(-c^2*x^2
+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 450, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.226$, Rules used = {4861, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c^4\sqrt{d-c^2dx^2}} + \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}} + \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} + \frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} + \frac{2bg^3x\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (3*b*f^2*g*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b*g^3*x*Sqrt[1
 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (3*b*f*g^2*x^2*Sqrt[1 - c^2*x^2]
)/(4*c*Sqrt[d - c^2*d*x^2]) + (b*g^3*x^3*Sqrt[1 - c^2*x^2])/(9*c*Sqrt[d - c
^2*d*x^2]) - (3*f^2*g*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c^2*Sqrt[d - c^2*
d*x^2]) - (2*g^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c^4*Sqrt[d - c^2*d*x
^2]) - (3*f*g^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*c^2*Sqrt[d - c^2*d*
x^2]) - (g^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c^2*Sqrt[d - c^2*d*x
^2]) + (f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*
x^2]) + (3*f*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c^3*Sqrt[d -
 c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{3f^2gx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{3fg^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{g^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(f^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}+\frac{\left(3f^2g\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}} + \frac{\left(3fg^2\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}+\frac{\left(g^3\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}-\frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}+\frac{\left(3bf^2g\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}} + \frac{\left(3fg^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{2c^2\sqrt{d-c^2dx^2}}+\frac{\left(3bfg^2\sqrt{1-c^2x^2}\right)\int x\,dx}{2c\sqrt{d-c^2dx^2}} + \frac{\left(2g^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{3c^2\sqrt{d-c^2dx^2}}+\frac{\left(bg^3\sqrt{1-c^2x^2}\right)\int x^2\,dx}{3c\sqrt{d-c^2dx^2}}$$

$$= \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} + \frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}-\frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))}{3c^4\sqrt{d-c^2dx^2}}-\frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}}+\frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}+\frac{\left(2bg^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{3c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2bg^3x\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}+\frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}-\frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))}{3c^4\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}}-\frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}+\frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.14 (sec) , antiderivative size = 343, normalized size of antiderivative = 0.76

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-18bc\sqrt{d}f(2c^2f^2+3g^2)(-1+c^2x^2)\arcsin(cx)^2-36acf(2c^2f^2+3g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx}{\sqrt{d}}\right.}{}$$

[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]

[Out] (-18*b*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 36*a*c*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - Sqrt[d]*g*(-1 + c^2*x^2)*(8*b*c*x*(6*g^2 + c^2*(27*f^2 + g^2*x^2)) - 12*a*Sqrt[1 - c^2*x^2]*(4*g^2 + c^2*(18*f^2 + 9*f*g*x + 2*g^2*x^2)) - 27*b*c*f*g*Cos[2*ArcSin[c*x]]) + 6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcSin[c*x]*(4*Sqrt[1 - c^2*x^2]*(2*g^2 + c^2*(9*f^2 + g^2*x^2)) + 9*c*f*g*Sin[2*ArcSin[c*x]]))/(72*c^4*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 856, normalized size of antiderivative = 1.90

method	result
default	$a\left(\frac{f^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^3\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+3f\,g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right.\right.$
parts	$a\left(\frac{f^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^3\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+3f\,g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right.\right.$

[In] int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] a*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2*f^2+3*g^2)+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*g^3*(I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(4*arcsin(c*x)*c^2*f^2+4*I*c^2*f^2+a

```
rcsin(c*x)*g^2+I*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(4*arcsin(c*x)*c^2*f^2-4*I*c^2*f^2+arcsin(c*
x)*g^2-I*g^2)/c^4/d/(c^2*x^2-1)+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2
*x^2+1)^(1/2)+2*c^2*x^2-1)*g^3*(-I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)+3/16*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2+3/8*(-d*(c^
2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*x-1/24*(-d*(c^2*x^2-1))
^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^3*cos(4*arcsin(c*x))+1/72*(-d*(c^2*x
^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*sin(4*arcsin(c*x))+3/16*(-d*(c^2*x^2-1))
^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*cos(3*arcsin(c*x))+3/8*(-d*(c^2*x^2-1))^(1/2
)/c^3/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^2*
d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
```

```
[Out] -1/3*a*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4*
d)) - 3/2*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d
))) + 1/2*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 3*b*f^2*g*x/(c*sqrt(d)) + a*f^3
*arcsin(c*x)/(c*sqrt(d)) - 3*sqrt(-c^2*d*x^2 + d)*b*f^2*g*arcsin(c*x)/(c^2*
d) - 3*sqrt(-c^2*d*x^2 + d)*a*f^2*g/(c^2*d) - sqrt(d)*integrate((b*g^3*x^3
+ 3*b*f*g^2*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))/(c^2*d*x^2 - d), x)
```

Giac [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate((g*x + f)^3*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.45 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 270

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2bfgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

```
[Out] -2*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-1/2*g^2*x*(-
c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+2*b*f*g*x*(-c^2*x^2+1
)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/4*b*g^2*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x
^2+d)^(1/2)+1/2*f^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+
d)^(1/2)+1/4*g^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d
)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {4861, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}} + \frac{2bfgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*b*f*g*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (b*g^2*x^2*Sqrt[1 -
 c^2*x^2])/(4*c*Sqrt[d - c^2*d*x^2]) - (2*f*g*(1 - c^2*x^2)*(a + b*ArcSin[c
*x]))/(c^2*Sqrt[d - c^2*d*x^2]) - (g^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))
/(2*c^2*Sqrt[d - c^2*d*x^2]) + (f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
)/(2*b*c*Sqrt[d - c^2*d*x^2]) + (g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^
2)/(4*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{2fgx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{g^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}} \\
&= \frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}+\frac{\left(2fg\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{2fg(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{\left(2bfg\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}} + \frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d-c^2dx^2}} + \frac{\left(bg^2\sqrt{1-c^2x^2}\right)\int x\,dx}{2c\sqrt{d-c^2dx^2}}$$

$$= \frac{2bfgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.66 (sec) , antiderivative size = 266, normalized size of antiderivative = 0.99

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{-2b\sqrt{d}(2c^2f^2+g^2)(-1+c^2x^2)\arcsin(cx)^2 - 4a(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-2*b*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 4*a*(2*c^2*f
^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*
x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-4*b*c*f*x
 + a*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]]) + 2*b*Sqrt[d]
*g*(-1 + c^2*x^2)*ArcSin[c*x]*(8*c*f*Sqrt[1 - c^2*x^2] + g*Sin[2*ArcSin[c*x
]]))/(8*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.87

method	result
default	$a\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-}}{}\right.$
parts	$a\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-}}{}\right.$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-1/2
*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*f^2+
g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsi
n(c*x)+I)/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*
c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2
/d/(c^2*x^2-1)*g^2*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2
-1)*g^2*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2
*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
+ 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
```

```
[Out] -1/2*a*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) + 1
/2*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + b*g^2*integrate(x^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 2*b*f
*g*x/(c*sqrt(d)) + a*f^2*arcsin(c*x)/(c*sqrt(d)) - 2*sqrt(-c^2*d*x^2 + d)*b
*f*g*arcsin(c*x)/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*f*g/(c^2*d)
```

Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate((g*x + f)^2*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.46 $\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 126

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

```
[Out] -g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+b*g*x*(-c^2*x^2+
1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/2*f*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2
)/b/c/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4861, 4847, 4737, 4767, 8}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} + \frac{bgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*g*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) - (g*(1 - c^2*x^2)*(a + b
*ArcSin[c*x]))/(c^2*Sqrt[d - c^2*d*x^2]) + (f*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}+\frac{\left(g\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}+\frac{\left(bg\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}}$$

$$= \frac{bgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\left(a+b\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.37

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$

$$= \frac{2\sqrt{d}g\left(-a+ac^2x^2+bcx\sqrt{1-c^2x^2}\right)+2b\sqrt{d}g(-1+c^2x^2)\arcsin(cx)+bc\sqrt{d}f\sqrt{1-c^2x^2}\arcsin(cx)^2-2ac}{2c^2\sqrt{d}\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*Sqrt[d]*g*(-a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2]) + 2*b*Sqrt[d]*g*(-1
 + c^2*x^2)*ArcSin[c*x] + b*c*Sqrt[d]*f*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - 2
*a*c*f*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))])/(2*c^2*Sqrt[d]*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.47 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.96

method	result
default	$\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}} - \frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d} + b\Bigg(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)} - \frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-c^2}\right.}{2c^2d(c^2x^2}$
parts	$\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}} - \frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d} + b\Bigg(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)} - \frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-c^2}\right.}{2c^2d(c^2x^2}$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a*g/c^2/d*(-
c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c
^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1
)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)
)
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fric
as")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(c
^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.71

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\frac{bf\arcsin(cx)^2}{2\,c\sqrt{d}}+\frac{bgx}{c\sqrt{d}}+\frac{af\arcsin(cx)}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2+d}bg\arcsin(cx)}{c^2d}-\frac{\sqrt{-c^2dx^2+d}ag}{c^2d}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] 1/2*b*f*arcsin(c*x)^2/(c*sqrt(d)) + b*g*x/(c*sqrt(d)) + a*f*arcsin(c*x)/(c*
sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*g*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2 +
 d)*a*g/(c^2*d)
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac
")
```

```
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.47 $\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 380

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

```
[Out] -I*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)
^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*(a+b
*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2))
)*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-b*polylog(2,I
*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)
/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+b*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)
/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {4861, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} - \frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} + \frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-I)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)
/(c*f - Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) +
(I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) - (b*
Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 -
g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Po
lyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^
2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \frac{a+bx}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2ce^{ix}f+ig-ie^{2ix}g}\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$=-\frac{\left(2ig\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{\left(2ig\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$=-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{\left(ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}-\frac{\left(ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$=-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$=-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)-b\,\text{PolyLog}\left(2,-\frac{i}{-c}\right.\right.}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*
g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f +
 Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) +
 Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.49 (sec) , antiderivative size = 508, normalized size of antiderivative = 1.34

method	result
default	$-\frac{a\ln\left(\frac{-\frac{2d(c^2f^2-g^2)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d(c^2f^2-g^2)}{g^2}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}}-\frac{ib\sqrt{-d(c^2x^2-1)}\sqrt{-c^2f^2}}{}$
parts	$-\frac{a\ln\left(\frac{-\frac{2d(c^2f^2-g^2)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d(c^2f^2-g^2)}{g^2}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}}-\frac{ib\sqrt{-d(c^2x^2-1)}\sqrt{-c^2f^2}}{}$

```
[In] int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a/g/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x
+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-
d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*f^2+g
^2)^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(
1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-I*arcsin(c*x)*l
n((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^
2+g^2)^(1/2)))+dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/
2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g
```

```
+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2))))/d/(c^2*x^2-1)/(c^2*f^
2-g^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="fric
as")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g*x^3 + c^2*d*f*x
^2 - d*g*x - d*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{\sqrt{-d\,(cx-1)\,(cx+1)}\,(f+gx)}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxi
ma")
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

3.48 $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 507

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx &= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} \\ &- \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &+ \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &- \frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\ &- \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &+ \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c^2*f^2-g^2)/(g*x+f)/(-c^2*d*x^2+d)^(1/2)
-b*c*ln(g*x+f)*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-I*c^2*
f*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^
(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+I*c^2*f
*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(
1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*c^2*f*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x
^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*c^2*f*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c
^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 507, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.323$, Rules used = {4861, 4857, 3405, 3404, 2296, 2221, 2317, 2438, 2747, 31}

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)\,(f+gx)} - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}} + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}} - \frac{bc^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}} + \frac{bc^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}} - \frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)}$$

```
[In] Int[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (g*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/((c^2*f^2 - g^2)*(f + g*x)*Sqrt[d - c
^2*d*x^2]) - (I*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I
*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]])/((c^2*f^2 - g^2)^(3/2)*Sqrt[
d - c^2*d*x^2]) + (I*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]])/((c^2*f^2 - g^2)^(3/2)*
Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^2]*Log[f + g*x])/((c^2*f^2 - g^2
)*Sqrt[d - c^2*d*x^2]) - (b*c^2*f*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcS
in[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]])/((c^2*f^2 - g^2)^(3/2)*Sqrt[d - c
^2*d*x^2]) + (b*c^2*f*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/
(c*f + Sqrt[c^2*f^2 - g^2])]])/((c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{a+bx}{(cf+g\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} + \frac{\left(c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{a+bx}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{\left(bcg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{1}{cf+x}\,dx,x,cgx\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{\left(2c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{\left(2ic^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{\left(2ic^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$=\frac{g(1-c^2x^2)(a+b\arcsin(cx))}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}-\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}+\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}+\frac{\left(ibc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}-\frac{\left(ibc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$=\frac{g(1-c^2x^2)(a+b\arcsin(cx))}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}-\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}+\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}+\frac{\left(bc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}-\frac{\left(bc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$=\frac{g(1-c^2x^2)(a+b\arcsin(cx))}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}-\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}+\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}-\frac{bc^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}+\frac{bc^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 295, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{c\sqrt{1-c^2x^2}\left(\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}-b\log(f+gx)+\frac{cf\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}}{cf+\sqrt{c^2f^2}}\right.\right.\right.}{\sqrt{c}}\right.}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

[In] Integrate[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]

[Out] (c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g*x) - b*Log[f + g*x] + (c*f*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt[d - c^2*d*x^2])

Maple [A] (verified)

Time = 0.65 (sec) , antiderivative size = 932, normalized size of antiderivative = 1.84

method	result
default	$\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}{d(c^2f^2-g^2)\left(x+\frac{f}{g}\right)}-\frac{a\,c^2f\ln\left(\frac{-\frac{2d\left(c^2f^2-g^2\right)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df(}{g}}}{x+\frac{f}{g}}\right.}{g(c^2f^2-g^2)\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}$
parts	$\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}{d(c^2f^2-g^2)\left(x+\frac{f}{g}\right)}-\frac{a\,c^2f\ln\left(\frac{-\frac{2d\left(c^2f^2-g^2\right)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df(}{g}}}{x+\frac{f}{g}}\right.}{g(c^2f^2-g^2)\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}$

[In] int((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] a/d/(c^2*f^2-g^2)/(x+f/g)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-a/g*c^2*f/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g))+b*(

```
(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)*(c^
2*f*x+g-I*(-c^2*x^2+1)^(1/2)*c*f)/d/(c^2*x^2-1)/(c^2*f^2-g^2)/(g*x+f)-(-c^2
*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))
*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^
2+g^2)^(1/2)*c*f+ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2
))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*c*f+2*ln(
I*c*x+(-c^2*x^2+1)^(1/2))*c^2*f^2-ln((I*c*x+(-c^2*x^2+1)^(1/2))^2*g+2*I*c*f
*(I*c*x+(-c^2*x^2+1)^(1/2))-g)*c^2*f^2+I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(
1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^
(1/2)*c*f-I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))
/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f-2*ln(I*c*x+(-c^2*x^
2+1)^(1/2))*g^2+ln((I*c*x+(-c^2*x^2+1)^(1/2))^2*g+2*I*c*f*(I*c*x+(-c^2*x^2+
1)^(1/2))-g)*g^2)*c/d/(c^2*x^2-1)/(c^2*f^2-g^2)^2)
```

Fricas [F]

$$\int \frac{a + b \arcsin(cx)}{(f + gx)^2 \sqrt{d - c^2 dx^2}} \, dx = \int \frac{b \arcsin(cx) + a}{\sqrt{-c^2 dx^2 + d}(gx + f)^2} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g^2*x^4 + 2*c^2*d
*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g^2)*x^2), x)
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(f + gx)^2 \sqrt{d - c^2 dx^2}} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{\sqrt{-d (cx - 1)(cx + 1)} (f + gx)^2} \, dx$$

```
[In] integrate((a+b*asin(c*x))/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2), x)
```

Maxima [F]

$$\int \frac{a + b\arcsin(cx)}{(f + gx)^2\sqrt{d - c^2dx^2}}\,dx = \int \frac{b\arcsin(cx) + a}{\sqrt{-c^2dx^2 + d}(gx + f)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(cx)}{(f + gx)^2\sqrt{d - c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{(f + gx)^2\sqrt{d - c^2dx^2}}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{(f + g\,x)^2\,\sqrt{d - c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.49 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 315

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{2c^4d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3\sqrt{1-c^2x^2}\log(1+cx)}{2c^4d\sqrt{d-c^2dx^2}}$$

```
[Out] (g*(3*c^2*f^2+g^2)+c^2*f*(c^2*f^2+3*g^2)*x)*(a+b*arcsin(c*x))/c^4/d/(-c^2*d
*x^2+d)^(1/2)+g^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(1/2)
-b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*(a+b*arcsi
n(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)^3*l
n(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)^3*ln(
c*x+1)*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.323, Rules

used = {4861, 4859, 651, 4845, 12, 647, 31, 4737, 4767, 8}

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(c^2fx(c^2f^2+3g^2)+g(3c^2f^2+g^2))\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}(cf-g)^3\log(cx+1)}{2c^4d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}(cf+g)^3\log(1-cx)}{2c^4d\sqrt{d-c^2dx^2}} - \frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((b*g^3*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2])) + ((g*(3*c^2*f^2
 + g^2) + c^2*f*(c^2*f^2 + 3*g^2)*x)*(a + b*ArcSin[c*x]))/(c^4*d*Sqrt[d - c
^2*d*x^2]) + (g^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c^4*d*Sqrt[d - c^2*d*
x^2]) - (3*f*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d
 - c^2*d*x^2]) + (b*(c*f + g)^3*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(2*c^4*d*Sq
rt[d - c^2*d*x^2]) + (b*(c*f - g)^3*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(2*c^4*
d*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{(c^2f^3+3fg^2+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}} - \frac{3fg^2(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}} - \frac{g^3x(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \frac{(c^2f^3+3fg^2+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(3fg^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(g^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)x}{c^2(1-c^2x^2)}\,dx}{cd\sqrt{d-c^2dx^2}} - \frac{\left(bg^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)x}{1-c^2x^2}\,dx}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)^3\sqrt{1-c^2x^2}\right)\int \frac{1}{-c-c^2x}\,dx}{2c^2d\sqrt{d-c^2dx^2}} - \frac{\left(b(cf+g)^3\sqrt{1-c^2x^2}\right)\int \frac{1}{c-c^2x}\,dx}{2c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{2c^4d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3\sqrt{1-c^2x^2}\log(1+cx)}{2c^4d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.81 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.62

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\Big(-2bcg^3x+2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{3cfg^2(a+b\arcsin(cx}{b}$$

[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]

[Out] (Sqrt[1 - c^2*x^2]*(-2*b*c*g^3*x + 2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (3*c*f*g^2*(a + b*ArcSin[c*x])^2)/b + (c*f - g)^3*(-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (c*f + g)^3*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 724, normalized size of antiderivative = 2.30

method	result
default	$a\left(\frac{f^3x}{d\sqrt{-c^2dx^2+d}}+g^3\left(-\frac{x^2}{c^2d\sqrt{-c^2dx^2+d}}+\frac{2}{dc^4\sqrt{-c^2dx^2+d}}\right)+3fg^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)-\right.$
parts	$a\left(\frac{f^3x}{d\sqrt{-c^2dx^2+d}}+g^3\left(-\frac{x^2}{c^2d\sqrt{-c^2dx^2+d}}+\frac{2}{dc^4\sqrt{-c^2dx^2+d}}\right)+3fg^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)-\right.$

[In] int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a*(f^3/d*x/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b*(3/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(arcsin(c*x)+I)/d^2/c^4/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g^3*(arcsin(c*x)-I)/d^2/c^4/(c^2*x^2-1)+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*f*(c^2*f^2+3*g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f^3*x+3*I*(-c^2*x^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(c^3*f^3-3*c^2*f^2*g+3*c*f*g^2-g^3)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/

d^2/c^4/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^4/(c^2*x^2-1)*(c^3*f^3+3*c^2*f^2*g+3*c*f*g^2+g^3)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] -a*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d)) + 3*a*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^3*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/2*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a*f^2*g/(sqrt(-c^2*d*x^2 + d)*c^2*d) - integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.50 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 213

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(2fg+(c^2f^2+g^2)\,x)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2\sqrt{1-c^2x^2}\log(1+cx)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[Out] (2*f*g+(c^2*f^2+g^2)*x)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*g^
2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b
*(c*f+g)^2*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(
c*f-g)^2*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {4861, 4859, 651, 4845, 647, 31, 4737}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(x(c^2f^2+g^2)+2fg)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}(cf-g)^2\log(cx+1)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}(cf+g)^2\log(1-cx)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] ((2*f*g + (c^2*f^2 + g^2)*x)*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2
]) - (g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d - c^2*
d*x^2]) + (b*(c*f + g)^2*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(2*c^3*d*Sqrt[d -
c^2*d*x^2]) + (b*(c*f - g)^2*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(2*c^3*d*Sqrt[
d - c^2*d*x^2])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
```

```
0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{(c^2f^2+g^2+2c^2fgx)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}}-\frac{g^2(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \frac{(c^2f^2+g^2+2c^2fgx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}-\frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}\\
&= \frac{\left(2fg+\left(c^2f^2+g^2\right)x\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}\\
&\quad -\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{2fg+(c^2f^2+g^2)x}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{\left(2fg+\left(c^2f^2+g^2\right)x\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}\\
&\quad -\frac{\left(b(cf-g)^2\sqrt{1-c^2x^2}\right)\int \frac{1}{-c-c^2x}\,dx}{2cd\sqrt{d-c^2dx^2}}-\frac{\left(b(cf+g)^2\sqrt{1-c^2x^2}\right)\int \frac{1}{c-c^2x}\,dx}{2cd\sqrt{d-c^2dx^2}}\\
&= \frac{\left(2fg+\left(c^2f^2+g^2\right)x\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}\\
&\quad +\frac{b(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{2c^3d\sqrt{d-c^2dx^2}}+\frac{b(cf-g)^2\sqrt{1-c^2x^2}\log(1+cx)}{2c^3d\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.73

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{g^2(a+b\arcsin(cx))^2}{b}+(-cf+g)^2\left(-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\right.\right.\right.}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(-((g^2*(a + b*ArcSin[c*x])^2)/b) + (-(c*f) + g)^2*(-((a
 + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[Sin[(Pi + 2*ArcSin
[c*x])/4]]) + (c*f + g)^2*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*Ar
cSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.78 (sec) , antiderivative size = 488, normalized size of antiderivative = 2.29

method	result
default	$a\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{2d^2c^3(c^2x^2-}\right.$
parts	$a\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{2d^2c^3(c^2x^2-}\right.$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOS
E)
```

```
[Out] a*(f^2/d*x/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(
c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/(-c^
2*d*x^2+d)^(1/2))+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/
(c^2*x^2-1)*g^2*arcsin(c*x)^2+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/d^2/c^3/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)*(c*x+
I*(-c^2*x^2+1)^(1/2))*arcsin(c*x)*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)*c*f*g
+2*x*c^2*f*g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/c^3/(c^2*x^2-1)*(c^2*f^2-2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2+2*c*f
*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2 +
 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="ma
xima")
```

```
[Out] a*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + b*f^2*
x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^2*x/(sqrt(-c^2*d*x^2 + d)*d) +
 sqrt(d)*integrate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)
, x) - 1/2*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) + 2*a*f*g/(sqrt(-c^2*d*x^2 +
d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.51 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 144

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}+\frac{b(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{2c^2d\sqrt{d-c^2dx^2}}+\frac{b(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{2c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (c^2*f*x+g)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)*ln(-
c*x+1)*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)*ln(c*x+1
)*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4861, 651, 4845, 12, 647, 31}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\frac{(c^2fx+g)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}(cf+g)\log(1-cx)}{2c^2d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}(cf-g)\log(cx+1)}{2c^2d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] ((g + c^2*f*x)*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (b*(c*f +
 g)*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(2*c^2*d*Sqrt[d - c^2*d*x^2]) + (b*(c*f
 - g)*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{g+c^2fx}{c^2(1-c^2x^2)}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{g+c^2fx}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)\sqrt{1-c^2x^2}\right)\int \frac{1}{-c-c^2x}\,dx}{2d\sqrt{d-c^2dx^2}} - \frac{\left(b(cf+g)\sqrt{1-c^2x^2}\right)\int \frac{1}{c-c^2x}\,dx}{2d\sqrt{d-c^2dx^2}}$$

$$= \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{2c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{2c^2d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+2\right.\right.}{}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x
])/4]) + 2*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (c*f + g)*(2*b*Log[Cos[(Pi
 + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])))/
(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.87 (sec) , antiderivative size = 305, normalized size of antiderivative = 2.12

method	result
default	$a\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,f\arcsin(cx)}{d^2c(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2x^2}\right.}{d^2c^2(c^2x^2-1)}\right.$
parts	$a\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,f\arcsin(cx)}{d^2c(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2x^2}\right.}{d^2c^2(c^2x^2-1)}\right.$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(f/d*x/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b*(2*I*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c/(c^2*x^2-1)*f*arcsin(c*x)-(-d*(c^2*
x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+c^2
```

```
*f*x+g)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(c*f-g)*ln(I*c*x+(-c^2*x^
2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-1)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/d^2/c^2/(c^2*x^2-1)*(c*f+g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(c^
4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f*x/(sqrt(-c^2*d*x^2 + d)*d)
 - 1/2*b*f*log(x^2 - 1/c^2)/(c*d^(3/2)) + (sqrt(c*x + 1)*sqrt(-c*x + 1)*c^3
*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*x^2 + (c^2*d^2*x^2 - d^2)*e^(log(
c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
)*b*g/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3/2)) + a*g/(sqrt(-c^2*d*x^2 + d
)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.52 $\int \frac{a+b\arcsin(cx)}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 654

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx &= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}\\&+\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}\\&-\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}\\&+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}}\\&+\frac{bg^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}-\frac{bg^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}\\&+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/2*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d/(c*
f-g)/(-c^2*d*x^2+d)^(1/2)+b*ln(cos(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1
/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+b*ln(sin(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*
x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+I*g^2*(a+b*arcsin(c*x))*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/
d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-I*g^2*(a+b*arcsin(c*x))*ln(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d
/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*g^2*polylog(2,I*(I*c*x+(-c^2*x^
2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)
```

```
^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*g^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d
*x^2+d)^(1/2)+1/2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*arcsi
n(c*x))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 654, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.355$, Rules used = {4861, 4859, 4857, 3399, 4269, 3556, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}}$$
$$-\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{d\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}}$$
$$+\frac{\sqrt{1-c^2x^2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}(cf+g)}$$
$$-\frac{\sqrt{1-c^2x^2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}(cf-g)}$$
$$+\frac{bg^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}}-\frac{bg^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\sqrt{d-c^2dx^2}\,(c^2f^2-g^2)^{3/2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{d\sqrt{d-c^2dx^2}(cf-g)}+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{d\sqrt{d-c^2dx^2}(cf+g)}$$

```
[In] Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/2*(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(d*(
c*f - g)*Sqrt[d - c^2*d*x^2]) + (I*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(d*(c^2*f^2
 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) - (I*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(d*(c^
2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[Cos[Pi/4
 + ArcSin[c*x]/2]])/(d*(c*f + g)*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2
]*Log[Sin[Pi/4 + ArcSin[c*x]/2]])/(d*(c*f - g)*Sqrt[d - c^2*d*x^2]) + (b*g^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
- g^2])])/(d*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) - (b*g^2*Sqrt[1 - c
^2*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(d
*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(2*d*(c*f + g)*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3556

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(-\frac{c(a+b\arcsin(cx))}{2(cf+g)(-1+cx)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))}{2(cf-g)(1+cx)\sqrt{1-c^2x^2}}+\frac{g^2(a+b\arcsin(cx))}{(-cf+g)(cf+g)(f+gx)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}} \\
&= \frac{\left(c\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{2d(cf-g)\sqrt{d-c^2dx^2}}-\frac{\left(c\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{a+bx}{c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} - \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{a+bx}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} + \frac{\left(g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{a+bx}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d(cf-g)\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d(cf+g)\sqrt{d-c^2dx^2}} + \frac{\left(2g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}$$

$$= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} - \frac{\left(2ig^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{\left(2ig^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(ibg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ibg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(bg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(bg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&+ \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{bg^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{bg^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.56 (sec) , antiderivative size = 359, normalized size of antiderivative = 0.55

$$
\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+2b\log\left(\sin\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)}{cf-g}+\frac{2g^2 \cdots}{\cdots}\right.}{\cdots}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2
*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/(c*f - g) + (2*g^2*(I*(a + b*ArcSin[c*
x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[
1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) + b*PolyLog[2, ((
-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - b*PolyLog[2, (I*
E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/((c*f - g)*(c*f + g)*Sq
rt[c^2*f^2 - g^2]) + (2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[
c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])/(c*f + g)))/(2*d*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 1.39 (sec) , antiderivative size = 1094, normalized size of antiderivative = 1.67

method	result	size
default	Expression too large to display	1094
parts	Expression too large to display	1094

```
[In] int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a*g/d/(c^2*f^2-g^2)/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/
g^2)^(1/2)+a*f/(c^2*f^2-g^2)/d/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2
*f^2-g^2)/g^2)^(1/2)*x*c^2+a*g/d/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)/g^2)^(1/2)
*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1
/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/
g))+b*(-(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+c^2*f*
x-g)/d^2/(c^2*x^2-1)/(c^2*f^2-g^2)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)*(-ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*c^3*f^3-ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c
^3*f^3+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c^3*f^3+ln(I*c*x+(-c^2*x^2+1)^(1/2)-I
)*c^2*f^2*g-ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*f^2*g+arcsin(c*x)*(-c^2*f^2+
g^2)^(1/2)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*
c*f+(-c^2*f^2+g^2)^(1/2)))*g^2-arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*ln((-I*c*f-
(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(-I*c*f+(-c^2*f^2+g^2)^(
1/2)))*g^2-I*(-c^2*f^2+g^2)^(1/2)*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g
+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*g^2+I*(-c^2*f^2+g^2)^(
1/2)*dilog((-I*c*f-(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(-I*c
*f+(-c^2*f^2+g^2)^(1/2)))*g^2+ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*c*f*g^2+ln(I*c
*x+(-c^2*x^2+1)^(1/2)+I)*c*f*g^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c*f*g^2-ln(
I*c*x+(-c^2*x^2+1)^(1/2)-I)*g^3+ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*g^3)/d^2/(c^
2*x^2-1)/(c^2*f^2-g^2)/(c*f-g)/(c*f+g))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(gx+f\right)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*g*x^5 + c^4*d^2*
f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2*g*x + d^2*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{\left(-d\,(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(f+gx)}\,dx$$

[In] integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)), x)

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx=\int \frac{b\arcsin\,(cx)+a}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxi ma")

[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac ")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err or: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

[In] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)

[Out] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)

3.53 $\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 528

$$\begin{aligned}\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\ &-\frac{bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}}\\ &+\frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}\\ &+\frac{(g+c^2fx)(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\ &+\frac{fg(2c^2f^2-5g^2)(1-c^2x^2)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}\\ &+\frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}}\\ &+\frac{b(cf-2g)(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{3c^5d^2\sqrt{d-c^2dx^2}}\\ &+\frac{b(cf-g)^3(cf+2g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^5d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*(g*x+f)*(g*(c^2*f^2-3*g^2)+2*c^2*f*(c^2*f^2-2*g^2)*x)*(a+b*arcsin(c*x))
/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+g)*(g*x+f)^3*(a+b*arcsin(c*x))/c
^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/3*f*g*(2*c^2*f^2-5*g^2)*(-c^2*x^
2+1)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b*(g*x+f)^2*(2*c^2*
f*g*x+c^2*f^2+g^2)/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*b*f*
g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)-1/2*b*g^4*arcsin(c*x)
^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+g^4*arcsin(c*x)*(a+b*arc
```

```
sin(c*x))*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-2*g)*(
c*f+g)^3*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(
c*f-g)^3*(c*f+2*g)*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2
)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 754, normalized size of antiderivative = 1.43, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.323, Rules used = {4861, 753, 833, 655, 222, 4845, 788, 647, 31, 4737}

$$\begin{aligned}
\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{(f+gx)^3\left(c^2fx+g\right)(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&+\frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} \\
&+\frac{fg(1-c^2x^2)\left(2c^2f^2-5g^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&+\frac{(f+gx)\left(2c^2fx(c^2f^2-2g^2)+g(c^2f^2-3g^2)\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&-\frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}}-\frac{bg\sqrt{1-c^2x^2}(cf+g)^3\log(1-cx)}{6c^5d^2\sqrt{d-c^2dx^2}} \\
&+\frac{bg\sqrt{1-c^2x^2}(cf-g)^3\log(cx+1)}{6c^5d^2\sqrt{d-c^2dx^2}} \\
&+\frac{b\sqrt{1-c^2x^2}(2cf-3g)(cf+g)^3\log(1-cx)}{6c^5d^2\sqrt{d-c^2dx^2}} \\
&+\frac{b\sqrt{1-c^2x^2}(cf-g)^3(2cf+3g)\log(cx+1)}{6c^5d^2\sqrt{d-c^2dx^2}} \\
&-\frac{bfgx\sqrt{1-c^2x^2}(2c^2f^2-5g^2)}{3c^3d^2\sqrt{d-c^2dx^2}}+\frac{2bfgx\sqrt{1-c^2x^2}(c^2f^2-2g^2)}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&-\frac{b(f+gx)^2\left(c^2f^2+2c^2fgx+g^2\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

```
[In] Int[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*(f + g*x)^2*(c^2*f^2 + g^2 + 2*c^2*f*g*x))/(c^3*d^2*Sqrt[1 - c^2*x^
2]*Sqrt[d - c^2*d*x^2]) - (2*b*f*g^3*x*Sqrt[1 - c^2*x^2])/(3*c^3*d^2*Sqrt[d
 - c^2*d*x^2]) - (b*f*g*(2*c^2*f^2 - 5*g^2)*x*Sqrt[1 - c^2*x^2])/(3*c^3*d^2
*Sqrt[d - c^2*d*x^2]) + (2*b*f*g*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2])/(3*
c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*g^4*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(2*c
^5*d^2*Sqrt[d - c^2*d*x^2]) + ((f + g*x)*(g*(c^2*f^2 - 3*g^2) + 2*c^2*f*(c^
2*f^2 - 2*g^2)*x)*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) + ((
g + c^2*f*x)*(f + g*x)^3*(a + b*ArcSin[c*x]))/(3*c^2*d^2*(1 - c^2*x^2)*Sqrt
```

```
[d - c^2*d*x^2]) + (f*g*(2*c^2*f^2 - 5*g^2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x
]))/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) + (g^4*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(a
 + b*ArcSin[c*x]))/(c^5*d^2*Sqrt[d - c^2*d*x^2]) + (b*(2*c*f - 3*g)*(c*f +
g)^3*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(6*c^5*d^2*Sqrt[d - c^2*d*x^2]) - (b*g
*(c*f + g)^3*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(6*c^5*d^2*Sqrt[d - c^2*d*x^2]
) + (b*(c*f - g)^3*g*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(6*c^5*d^2*Sqrt[d - c^
2*d*x^2]) + (b*(c*f - g)^3*(2*c*f + 3*g)*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(6
*c^5*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 753

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(d + e*x)^(m - 1)*(a*e - c*d*x)*((a + c*x^2)^(p + 1)/(2*a*c*(p + 1))), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 788

```
Int[(((d_.) + (e_.)*(x_))*((f_) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2), x_Sym
bol] :> Simp[e*g*(x/c), x] + Dist[1/c, Int[(c*d*f - a*e*g + c*(e*f + d*g)*x
)/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e, f, g}, x]
```

Rule 833

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1)*((a*(e*f + d*g
) - (c*d*f - a*e*g)*x)/(2*a*c*(p + 1))), x] - Dist[1/(2*a*c*(p + 1)), Int[(
d + e*x)^(m - 2)*(a + c*x^2)^(p + 1)*Simp[a*e*(e*f*(m - 1) + d*g*m) - c*d^2
*f*(2*p + 3) + e*(a*e*g*m - c*d*f*(m + 2*p + 2))*x, x], x], x] /; FreeQ[{a,
 c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] &&
(EqQ[d, 0] || (EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, c, d, e, f, g]) ||
!ILtQ[m + 2*p + 3, 0])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int\left(\frac{fg(2c^2f^2-5g^2)}{3c^4}+\frac{(g+c^2fx)(f+gx)^3}{3c^2(1-c^2x^2)^2}+\frac{(f+gx)(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)x)}{3c^4(1-c^2x^2)}+\frac{g^4\arcsin(cx)}{c^5\sqrt{1-c^2x^2}}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bfg(2c^2f^2-5g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{(f+gx)(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)x)}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{(g+c^2fx)(f+gx)^3}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}} - \frac{\left(bg^4\sqrt{1-c^2x^2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^4d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bfg(2c^2f^2-5g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{2bfg(c^2f^2-2g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}$$
$$+ \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{-c^2fg(c^2f^2-3g^2)-2c^2fg(c^2f^2-2g^2)-c^2\left(g^2(c^2f^2-3g^2)+2c^2f^2(c^2f^2-2g^2)\right)x}{1-c^2x^2}\,dx}{3c^5d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{(f+gx)\left(2g(c^2f^2+g^2)+4c^2fg^2x\right)}{1-c^2x^2}\,dx}{6c^3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bfg(2c^2f^2-5g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{2bfg(c^2f^2-2g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}$$
$$+ \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{-4c^2fg^3-2c^2fg(c^2f^2+g^2)-c^2\left(4c^2f^2g^2+2g^2(c^2f^2+g^2)\right)x}{1-c^2x^2}\,dx}{6c^5d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(b(2cf-3g)(cf+g)^3\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}\,dx}{6c^3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(b(cf-g)^3(2cf+3g)\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}\,dx}{6c^3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{2bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bfg(2c^2f^2-5g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{2bfg(c^2f^2-2g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}} + \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} + \frac{b(2cf-3g)(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3(2cf+3g)\sqrt{1-c^2x^2}\log(1+cx)}{6c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)^3g\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}\,dx}{6c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left(bg(cf+g)^3\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}\,dx}{6c^3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{2bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bfg(2c^2f^2-5g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{2bfg(c^2f^2-2g^2)\,x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}} + \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)\,x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{fg(2c^2f^2-5g^2)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} + \frac{b(2cf-3g)(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{6c^5d^2\sqrt{d-c^2dx^2}} - \frac{bg(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3g\sqrt{1-c^2x^2}\log(1+cx)}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3(2cf+3g)\sqrt{1-c^2x^2}\log(1+cx)}{6c^5d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 2.55 (sec) , antiderivative size = 868, normalized size of antiderivative = 1.64

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \sqrt{-d\left(-1+c^2x^2\right)}\left(\frac{4ac^2f^3g+4afg^3+ac^4f^4x+6ac^2f^2g^2x+ag^4x}{3c^4d^3\left(-1+c^2x^2\right)^2} - \frac{2a(-6fg^3+c^4f^4x-3c^2f^2g^2x-2g^4x)}{3c^4d^3\left(-1+c^2x^2\right)}\right) - \frac{ag^4\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^5d^{5/2}} + \frac{bf^2g^2\left(-2cx\arcsin(cx)+\frac{-1+\frac{2cx\arcsin(cx)}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}-2\sqrt{1-c^2x^2}\log\left(\sqrt{1-c^2x^2}\right)\right)}{c^3d^2\sqrt{d\left(1-c^2x^2\right)}} + \frac{bf^4\left(4cx\arcsin(cx)+\frac{-1+\frac{2cx\arcsin(cx)}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}+4\sqrt{1-c^2x^2}\log\left(\sqrt{1-c^2x^2}\right)\right)}{6cd^2\sqrt{d\left(1-c^2x^2\right)}} + \frac{bf^3g\left(8\arcsin(cx)+3\sqrt{1-c^2x^2}\left(\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)-\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)+\text{s}\right.\right.\right.}{} - \frac{bfg^3\left(4\arcsin(cx)+12\arcsin(cx)\cos(2\arcsin(cx))+5\cos(3\arcsin(cx))\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\text{a}\right.\right.\right.}{} + \frac{bg^4\left(\sqrt{1-c^2x^2}\left(3\arcsin(cx)^2-8\log\left(\sqrt{1-c^2x^2}\right)\right)-\frac{1+\frac{2\arcsin(cx)\sin(3\arcsin(cx))}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}\right)}{6c^5d^2\sqrt{d\left(1-c^2x^2\right)}}$$

```
[In] Integrate[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*((4*a*c^2*f^3*g + 4*a*f*g^3 + a*c^4*f^4*x + 6*a*c
^2*f^2*g^2*x + a*g^4*x)/(3*c^4*d^3*(-1 + c^2*x^2)^2) - (2*a*(-6*f*g^3 + c^4
*f^4*x - 3*c^2*f^2*g^2*x - 2*g^4*x))/(3*c^4*d^3*(-1 + c^2*x^2))) - (a*g^4*A
rcTan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^5*d^(5/
2)) + (b*f^2*g^2*(-2*c*x*ArcSin[c*x] + (-1 + (2*c*x*ArcSin[c*x])/Sqrt[1 - c
^2*x^2])/Sqrt[1 - c^2*x^2] - 2*Sqrt[1 - c^2*x^2]*Log[Sqrt[1 - c^2*x^2]]))/(
c^3*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^4*(4*c*x*ArcSin[c*x] + (-1 + (2*c*x*A
rcSin[c*x])/Sqrt[1 - c^2*x^2])/Sqrt[1 - c^2*x^2] + 4*Sqrt[1 - c^2*x^2]*Log[
Sqrt[1 - c^2*x^2]]))/(6*c*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^3*g*(8*ArcSin[c
*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]]*(Log[Cos[
ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(6*c^2*d*(d*(1 - c^2*x^2))^(3/2)) - (b*f
*g^3*(4*ArcSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 5*Cos[3*ArcSin[c*
x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 15*Sqrt[1 - c^2*x^2]*(Lo
g[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2]]) - 5*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2]] + 2*Sin[2*ArcSin[c*x]]))/(6*c^4*d*(d*(1 - c^2*x^2))^(3/2)) + (b*g^
```

```
4*(Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]^2 - 8*Log[Sqrt[1 - c^2*x^2]]) - (1 + (2
*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/Sqrt[1 - c^2*x^2])/Sqrt[1 - c^2*x^2]))/(6*
c^5*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.02 (sec) , antiderivative size = 6743, normalized size of antiderivative = 12.77

method	result	size
default	Expression too large to display	6743
parts	Expression too large to display	6743

```
[In] int((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^4(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fr
icas")
```

```
[Out] integral(-(a*g^4*x^4 + 4*a*f*g^3*x^3 + 6*a*f^2*g^2*x^2 + 4*a*f^3*g*x + a*f^
4 + (b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2 + 4*b*f^3*g*x + b*f^4)*arc
sin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})\,(f+gx)^4}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x)**4/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^4(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="ma
xima")
```

```
[Out] 1/6*b*c*f^4*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2
)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^4*(2*x/(sqrt(-c^2*d*x^2 + d)*d
^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*(x*(3*x^2/((-c^2*d*x^
2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - x/(sqrt(-c^2*d*x^
2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a*g^4 + 1/3*a*f^4*(2*x/(sqrt
(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 4/3*a*f*g^3*(3*x^2/
((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - 2*a*f^
2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))
 - sqrt(d)*integrate((b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2 + 4*b*f^3
*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 4/3*a*f^3*g/((
-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{{\left(f+g\,x\right)}^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.54 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(f+gx)\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\
&+\frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}\\
&+\frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}+\frac{b(cf-g)(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{3c^4d^2\sqrt{d-c^2dx^2}}\\
&-\frac{bg(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{12c^4d^2\sqrt{d-c^2dx^2}}+\frac{b(cf-g)^2g\sqrt{1-c^2x^2}\log(1+cx)}{12c^4d^2\sqrt{d-c^2dx^2}}\\
&+\frac{b(cf-g)^2(cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^4d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 2/3*(c*f-g)*(c*f+g)*(c^2*f*x+g)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1
/2)+1/3*(c^2*f*x+g)*(g*x+f)^2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)/(-c^2*
d*x^2+d)^(1/2)-1/6*b*(g*x+f)*(2*c^2*f*g*x+c^2*f^2+g^2)/c^3/d^2/(-c^2*x^2+1)
^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)*(c*f+g)^2*ln(-c*x+1)*(-c^2*x^2+1)
^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*g*(c*f+g)^2*ln(-c*x+1)*(-c^2*x^2
+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/12*b*(c*f-g)^2*g*ln(c*x+1)*(-c^2*x
^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)^2*(c*f+g)*ln(c*x+1)*
(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {4861, 737, 651, 4845, 833, 647, 31}

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\frac{(f+gx)^2\,(c^2fx+g)\,(a+b\arcsin(cx))}{3c^2d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}}+\frac{2(cf+g)(cf-g)\,(c^2fx+g)\,(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{bg\sqrt{1-c^2x^2}(cf-g)^2\log(cx+1)}{12c^4d^2\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}(cf+g)(cf-g)^2\log(cx+1)}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}(cf+g)^2(cf-g)\log(1-cx)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bg\sqrt{1-c^2x^2}(cf+g)^2\log(1-cx)}{12c^4d^2\sqrt{d-c^2dx^2}}-\frac{b(f+gx)\,(c^2f^2+2c^2fgx+g^2)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*(f + g*x)*(c^2*f^2 + g^2 + 2*c^2*f*g*x))/(c^3*d^2*Sqrt[1 - c^2*x^2]
*Sqrt[d - c^2*d*x^2]) + (2*(c*f - g)*(c*f + g)*(g + c^2*f*x)*(a + b*ArcSin[
c*x]))/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) + ((g + c^2*f*x)*(f + g*x)^2*(a + b*
ArcSin[c*x]))/(3*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) + (b*(c*f - g)*
(c*f + g)^2*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(3*c^4*d^2*Sqrt[d - c^2*d*x^2])
 - (b*g*(c*f + g)^2*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(12*c^4*d^2*Sqrt[d - c^
2*d*x^2]) + (b*(c*f - g)^2*g*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(12*c^4*d^2*Sq
rt[d - c^2*d*x^2]) + (b*(c*f - g)^2*(c*f + g)*Sqrt[1 - c^2*x^2]*Log[1 + c*x
])/(3*c^4*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 737

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(d + e*x)^(m - 1)*(a*e - c*d*x)*((a + c*x^2)^(p + 1)/(2*a*c*(p + 1))), x] +
 Dist[(2*p + 3)*((c*d^2 + a*e^2)/(2*a*c*(p + 1))), Int[(d + e*x)^(m - 2)*(a
 + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0
] && EqQ[m + 2*p + 2, 0] && LtQ[p, -1]
```

Rule 833

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1)*((a*(e*f + d*g
) - (c*d*f - a*e*g)*x)/(2*a*c*(p + 1))), x] - Dist[1/(2*a*c*(p + 1)), Int[(
d + e*x)^(m - 2)*(a + c*x^2)^(p + 1)*Simp[a*e*(e*f*(m - 1) + d*g*m) - c*d^2
*f*(2*p + 3) + e*(a*e*g*m - c*d*f*(m + 2*p + 2))*x, x], x], x] /; FreeQ[{a,
 c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] &&
(EqQ[d, 0] || (EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, c, d, e, f, g]) ||
!ILtQ[m + 2*p + 3, 0])
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int\left(\frac{(g+c^2fx)(f+gx)^2}{3c^2(1-c^2x^2)^2}+\frac{2(cf-g)(cf+g)(g+c^2fx)}{3c^4(1-c^2x^2)}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{(g+c^2fx)(f+gx)^2}{(1-c^2x^2)^2}dx}{3cd^2\sqrt{d-c^2dx^2}} - \frac{\left(2b(cf-g)(cf+g)\sqrt{1-c^2x^2}\right)\int\frac{g+c^2fx}{1-c^2x^2}dx}{3c^3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{g(c^2f^2+g^2)+2c^2fg^2x}{1-c^2x^2}dx}{6c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)^2(cf+g)\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}dx}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)(cf+g)^2\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}dx}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{b(cf-g)(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2(cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)^2g\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}dx}{12c^2d^2\sqrt{d-c^2dx^2}} + \frac{\left(bg(cf+g)^2\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}dx}{12c^2d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{b(cf-g)(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bg(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{12c^4d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2g\sqrt{1-c^2x^2}\log(1+cx)}{12c^4d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2(cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.95 (sec) , antiderivative size = 366, normalized size of antiderivative = 0.89

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(ibcg(3c^2f^2-5g^2)\left(1-c^2x^2\right)^{3/2}\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right)\right.\right.}{}$$

```
[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(I*b*c*g*(3*c^2*f^2 - 5*g^2)*(1 - c^2*x^2)^(3/2)*Ellip
ticF[I*ArcSinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-6*a*c^2*f^2*g + 4*a*g^3 - 6
*a*c^4*f^3*x - 6*a*c^2*g^3*x^2 + 4*a*c^6*f^3*x^3 - 6*a*c^4*f*g^2*x^3 + b*c^
3*f^3*Sqrt[1 - c^2*x^2] + 3*b*c*f*g^2*Sqrt[1 - c^2*x^2] + 3*b*c^3*f^2*g*x*S
qrt[1 - c^2*x^2] + b*c*g^3*x*Sqrt[1 - c^2*x^2] + 2*b*(2*g^3 + 2*c^6*f^3*x^3
 - 3*c^2*g*(f^2 + g^2*x^2) - 3*c^4*f*x*(f^2 + g^2*x^2))*ArcSin[c*x] - b*c*f
*(2*c^2*f^2 - 3*g^2)*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2])))/(6*c^4*Sqrt[-
c^2]*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.01 (sec) , antiderivative size = 5114, normalized size of antiderivative = 12.47

method	result	size
default	Expression too large to display	5114
parts	Expression too large to display	5114

```
[In] int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fr
icas")
```

```
[Out] integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*
d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="ma
xima")
[Out] 1/6*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2
)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^3*(2*x/(sqrt(-c^2*d*x^2 + d)*d
^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^3*(2*x/(sqrt(-c^2
*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a*g^3*(3*x^2/((-c^2*
d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - a*f*g^2*(x/(s
qrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + integrat
e((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x +
1)), x)/sqrt(d) + a*f^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="gi
ac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
[Out] int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.55 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 271

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{bx(2fg+(c^2f^2+g^2)\,x)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} + \frac{b(2cf-g)(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{6c^3d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)(2cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 2/3*f*(c^2*f*x+g)*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*x*(g*x
+f)^2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(2*f*
g+(c^2*f^2+g^2)*x)/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/6*b*(2*c
*f-g)*(c*f+g)*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+1/
6*b*(c*f-g)*(2*c*f+g)*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(
1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.31, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.226$, Rules used

= {4861, 743, 651, 4845, 833, 647, 31}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{2f(c^2fx+g)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b(f+gx)^2}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}(cf+g)\log(1-cx)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}(cf-g)\log(cx+1)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}(cf+g)\log(1-cx)}{6c^3d^2\sqrt{d-c^2dx^2}} + \frac{bg\sqrt{1-c^2x^2}(cf-g)\log(cx+1)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*(f + g*x)^2)/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*f*(
g + c^2*f*x)*(a + b*ArcSin[c*x]))/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) + (x*(f +
 g*x)^2*(a + b*ArcSin[c*x]))/(3*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) + (b
*f*(c*f + g)*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]
) - (b*g*(c*f + g)*Sqrt[1 - c^2*x^2]*Log[1 - c*x])/(6*c^3*d^2*Sqrt[d - c^2*
d*x^2]) + (b*f*(c*f - g)*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(3*c^2*d^2*Sqrt[d
- c^2*d*x^2]) + (b*(c*f - g)*g*Sqrt[1 - c^2*x^2]*Log[1 + c*x])/(6*c^3*d^2*S
qrt[d - c^2*d*x^2])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 647

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[(-
a)*c, 2]}, Dist[e/2 + c*(d/(2*q)), Int[1/(-q + c*x), x], x] + Dist[e/2 - c*
(d/(2*q)), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
(-a)*c]
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(-(d + e*x)^m)*(2*c*x)*((a + c*x^2)^(p + 1)/(4*a*c*(p + 1))), x] - Dist[m*(
(2*c*d)/(4*a*c*(p + 1))), Int[(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1), x], x]
 /; FreeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p +
3, 0] && LtQ[p, -1]
```

Rule 833

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1)*((a*(e*f + d*g
) - (c*d*f - a*e*g)*x)/(2*a*c*(p + 1))), x] - Dist[1/(2*a*c*(p + 1)), Int[(
d + e*x)^(m - 2)*(a + c*x^2)^(p + 1)*Simp[a*e*(e*f*(m - 1) + d*g*m) - c*d^2
*f*(2*p + 3) + e*(a*e*g*m - c*d*f*(m + 2*p + 2))*x, x], x], x] /; FreeQ[{a,
 c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] &&
(EqQ[d, 0] || (EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, c, d, e, f, g]) ||
!ILtQ[m + 2*p + 3, 0])
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}} \\
&= \frac{2f(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \left(\frac{x(f+gx)^2}{3(1-c^2x^2)^2}+\frac{2f(g+c^2fx)}{3c^2(1-c^2x^2)}\right)dx}{d^2\sqrt{d-c^2dx^2}} \\
&= \frac{2f(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x(f+gx)^2}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(2bf\sqrt{1-c^2x^2}\right)\int \frac{g+c^2fx}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{b(f+gx)^2}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{2fg+2g^2x}{1-c^2x^2}\,dx}{6cd^2\sqrt{d-c^2dx^2}} - \frac{\left(bf(cf-g)\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}\,dx}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(bf(cf+g)\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{bf(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{\left(b(cf-g)g\sqrt{1-c^2x^2}\right)\int\frac{1}{-c-c^2x}\,dx}{6cd^2\sqrt{d-c^2dx^2}} + \frac{\left(bg(cf+g)\sqrt{1-c^2x^2}\right)\int\frac{1}{c-c^2x}\,dx}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)^2}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{bf(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bg(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{6c^3d^2\sqrt{d-c^2dx^2}} + \frac{bf(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)g\sqrt{1-c^2x^2}\log(1+cx)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.75 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.05

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{c\sqrt{d-c^2dx^2}\left(2ibc^2fg(1-c^2x^2)^{3/2}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right),1\right)-\sqrt{-}\right.}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (c*Sqrt[d - c^2*d*x^2]*((2*I)*b*c^2*f*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*Arc
Sinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-4*a*c*f*g - 6*a*c^3*f^2*x + 4*a*c^5*f
^2*x^3 - 2*a*c^3*g^2*x^3 + b*c^2*f^2*Sqrt[1 - c^2*x^2] + b*g^2*Sqrt[1 - c^2
*x^2] + 2*b*c^2*f*g*x*Sqrt[1 - c^2*x^2] + 2*b*c*(-2*f*g - c^2*g^2*x^3 + c^2
*f^2*x*(-3 + 2*c^2*x^2))*ArcSin[c*x] - b*(2*c^2*f^2 - g^2)*(1 - c^2*x^2)^(3
/2)*Log[-1 + c^2*x^2])))/(6*(-c^2)^(5/2)*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.88 (sec) , antiderivative size = 3783, normalized size of antiderivative = 13.96

method	result	size
default	Expression too large to display	3783
parts	Expression too large to display	3783

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] -14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^
4*x^6*f*g+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^2*(-c^2*x^2+1)*x^5*g^2+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x
^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^4*f*g-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*f^2+4/
3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*
x^2+1)^(1/2)*x*f*g-8/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+1
1*c^2*x^2-4)*c^4*arcsin(c*x)*x^6*f*g+4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*
x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*arcsin(c*x)*x^3*g^2+7*b*(-d*(c^2*
x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^5*g
^2-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*a
rcsin(c*x)*x^7*g^2-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*
c^2*x^2-4)*c^4*arcsin(c*x)*x^5*f^2+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^
6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x*f^2-6*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x^2*f*g+17/3*b*(-d*(c^2*x
^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3*f^
2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-
c^2*x^2+1)^(1/2)*x^2*f^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4
*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*x^2*g^2+2*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*arcsin(c*x)*x*g^2-2/3*b*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^3/c/(c^
2*x^2-1)*f^2+1/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*ln(I*c*x+(-c^2
*x^2+1)^(1/2)+I)/d^3/c^3/(c^2*x^2-1)*g^2-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)/d^3/c/(c^2*x^2-1)*f^2+1/3*b*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)/d^3/
c^3/(c^2*x^2-1)*g^2-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^
4+11*c^2*x^2-4)*c^4*x^5*f^2-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-1
0*c^4*x^4+11*c^2*x^2-4)*c^2*x^5*g^2+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7*f^2+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^7*g^2-5/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x^3*g^2-2*I*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x^2*f*g+8/3*
I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3*
```

f^2-I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*
x*g^2-10/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*c^2*(-c^2*x^2+1)*x^4*f*g+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-
10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*f^2+4/3*I*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^3*(-c^2*x^2
+1)^(1/2)*arcsin(c*x)*g^2+2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^
4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x^2*f*g+4/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)*arcsin(c*x)/d^3/c/(c^2*x^2-1)*f^2+8*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^4*f*g+16/3*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*a
rcsin(c*x)*x^2*f*g-2/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*arcsin
(c*x)/d^3/c^3/(c^2*x^2-1)*g^2+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6
-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^8*f*g+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3
*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5*f^2+2/3*b*(-d*(c^2*x
^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*f
^2+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^3
*(-c^2*x^2+1)^(1/2)*g^2-22/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4
*x^4+11*c^2*x^2-4)*arcsin(c*x)*x^3*g^2-4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^
6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x*f^2+8/3*I*b*(-d*(c^2*x^2-1))^(
1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x^3*g^2-I*b*(-d*(c^2*x^2-1))^(
1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x*f^2+I*b*(-d*(c^2*x^2-1))^(1/
2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*x^4*g^2-8/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*c^2*(-c^2*x^2+1)*arcsin(c*x)*x^4*f*g-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*g^
2+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^
4*(-c^2*x^2+1)*x^6*f*g-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*f^2+a*(f^2*(1/3/d*x
/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+g^2*(1/2*x/c^2/d/(-c^
2*d*x^2+d)^(3/2)-1/2/c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^
2+d)^(1/2)))+2/3*f*g/c^2/d/(-c^2*d*x^2+d)^(3/2))-8/3*b*(-d*(c^2*x^2-1))^(1/
2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*(-c^2*x^2+1)*arcsin(c*x)*f*g
-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x
^2+1)^(1/2)*x^3*f*g+1/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*ln(I*c*
x+(-c^2*x^2+1)^(1/2)+I)/d^3/c^2/(c^2*x^2-1)*f*g-1/3*b*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)/d^3/c^2/(c^2*x^2-1)*f*g
-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*(-c
^2*x^2+1)*arcsin(c*x)*x*g^2-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^
4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*arcsin(c*x)*x^5*g^2+I*b*(-d*(c^2*x^2-1
))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*(-c^2*x^2+1)*x*g^2-5/3
*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c
^2*x^2+1)*x^3*f^2

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2 + 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

[In] integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)

[Out] Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")

[Out] 1/6*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^2*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^2*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) - sqrt(d)*integrate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 2/3*a*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.56 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 228

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[Out] 2/3*f*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+g)*(a+b*arc
sin(c*x))/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/6*b*(g*x+f)/c/d^2/(-c
^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*g*arctanh(c*x)*(-c^2*x^2+1)^(1/2
)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*f*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c/
d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {4861, 653, 197, 4845, 212, 266}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{(c^2fx+g)\,(a+b\arcsin(cx))}{3c^2d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} - \frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*(f + g*x))/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*f*x*(
a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) + ((g + c^2*f*x)*(a + b*Arc
Sin[c*x]))/(3*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) - (b*g*Sqrt[1 - c^
2*x^2]*ArcTanh[c*x])/(6*c^2*d^2*Sqrt[d - c^2*d*x^2]) + (b*f*Sqrt[1 - c^2*x^
2]*Log[1 - c^2*x^2])/(3*c*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 653

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)/(2*a*c*(p + 1)))*(a + c*x^2)^(p + 1), x] + Dist[d*((2*p + 3)/(2*a
*(p + 1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int\left(\frac{g+c^2fx}{3c^2(1-c^2x^2)^2}+\frac{2fx}{3(1-c^2x^2)}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{g+c^2fx}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}} - \frac{\left(2bcf\sqrt{1-c^2x^2}\right)\int\frac{x}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}} - \frac{\left(bg\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}\,\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.57 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.91

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx =$$

$$-\frac{\sqrt{d-c^2dx^2}\left(ibcg(1-c^2x^2)^{3/2}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right),1\right)+\sqrt{-c^2}\left(2ag+6ac^2fx-4ac^4fx^3-bcf\sqrt{\right.\right.}{6\left(-c^2\right)^{3/2}d^3\left(\right.}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(I*b*c*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh[
Sqrt[-c^2]*x], 1] + Sqrt[-c^2]*(2*a*g + 6*a*c^2*f*x - 4*a*c^4*f*x^3 - b*c*f
*Sqrt[1 - c^2*x^2] - b*c*g*x*Sqrt[1 - c^2*x^2] + 2*b*(g + c^2*f*x*(3 - 2*c^
2*x^2))*ArcSin[c*x] + 2*b*c*f*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2])))/((-c
^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.96 (sec) , antiderivative size = 2237, normalized size of antiderivative = 9.81

method	result	size
default	Expression too large to display	2237
parts	Expression too large to display	2237

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*
x^7*f+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*f+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^6*g-5/3*I*b*(-d*(c
^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x
^3*f-3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arc
sin(c*x)*x^2*g-4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*
x^2-4)*f*x*arcsin(c*x)+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*f-I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*f*x-I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x
^6-10*c^4*x^4+11*c^2*x^2-4)*x^2*g-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6
*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^6*g-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5*f+8/3*I*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^4*g+8/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3*f+I*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x^2*g+I*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x
*f+17/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^
2*arcsin(c*x)*x^3*f-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+
11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2*f-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^3/(c^2*x^2-1)/c*f+1/6*b*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^3/(c
^2*x^2-1)/c^2*g+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11
*c^2*x^2-4)*c^6*x^8*g-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(
c^2*x^2-1)/c*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*f-1/6*b*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*g-4/3
*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsi
```

```
n(c*x)*x^6*g-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^
2-4)*c^4*arcsin(c*x)*x^5*f+4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4
*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^4*g-4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(
3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*(-c^2*x^2+1)*arcsin(c*x)*g+2/3*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^
(1/2)*x*g+8/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2
-4)*(-c^2*x^2+1)*arcsin(c*x)*x^2*g-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*
x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^3*g+4/3*I*b*(-c^2*x^2+1
)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/c/(c^2*x^2-1)*f*arcsin(c*x)+2/3*I*b*(-d*
(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)
*x^5*f-5/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*c^2*(-c^2*x^2+1)*x^4*g-4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^
4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*arcsin(c*x)*x^4*g-8/3*I*b*(-d*(c^2*x^2
-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arc
sin(c*x)*f-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^
2-4)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*f+a*(f*(1/3/d*x/(-c^2*d*x^2+d)^
(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+1/3*g/c^2/d/(-c^2*d*x^2+d)^(3/2))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(c
^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxi
ma")
```

```
[Out] 1/6*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2))
 + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2)
+ x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f*(2*x/(sqrt(-c^2*d*x^2
 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + b*g*integrate(x*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.57 $\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1300

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} - \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf+g)\sqrt{d-c^2dx^2}} + \frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}} + \frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf-g)\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{bg^4\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}} + \frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$

```
[Out] -1/4*(c*f-2*g)*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(
1/2)/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)-1/12*(a+b*arcsin(c*x))*cot(1/4*Pi+1
/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-1/24*b*
csc(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)
```

```
^(1/2)-1/24*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*ar
csin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+1/6*b*ln(c
os(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f+g)/(-c^2*d*x^2+d)^(
1/2)+1/2*b*(c*f+2*g)*ln(cos(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2
/(c*f+g)^2/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-2*g)*ln(sin(1/4*Pi+1/2*arcsin(c*
x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)+1/6*b*ln(sin(1/4
*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-I
*g^4*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^(1/2)+
I*g^4*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g
^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^(1/2)
-b*g^4*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*
(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^(1/2)+b*g^4*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)
^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^(1/2)-1/24*b*sec(1/4*Pi+1/2*a
rcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+1/12*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*arcsin(c*x))/d^2/(c*f+g)/(-
c^2*d*x^2+d)^(1/2)+1/4*(c*f+2*g)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*tan(1
/4*Pi+1/2*arcsin(c*x))/d^2/(c*f+g)^2/(-c^2*d*x^2+d)^(1/2)+1/24*(a+b*arcsin(
c*x))*sec(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*arcsi
n(c*x))/d^2/(c*f+g)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 1.33 (sec) , antiderivative size = 1300, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.387$, Rules

used = {4861, 4859, 4857, 3399, 4270, 4269, 3556, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)g^4}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)g^4}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{b\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)g^4}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)g^4}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{6d^2(cf+g)\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{6d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/4*((c*f - 2*g)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c
*x]/2])/(d^2*(c*f - g)^2*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(12*d^2*(c*f - g)*Sqrt[d - c^2*d*x^2
]) - (b*Sqrt[1 - c^2*x^2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*d^2*(c*f - g)*Sq
```

```
rt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Cot[Pi/4 + ArcS
in[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*d^2*(c*f - g)*Sqrt[d - c^2*d*x^
2]) - (I*g^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c
*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(d^2*(c*f - g)^2*(c*f + g)^2*Sqrt[c^2
*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) + (I*g^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(d^2*(c*
f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 -
 c^2*x^2]*Log[Cos[Pi/4 + ArcSin[c*x]/2]])/(6*d^2*(c*f + g)*Sqrt[d - c^2*d*x
^2]) + (b*(c*f + 2*g)*Sqrt[1 - c^2*x^2]*Log[Cos[Pi/4 + ArcSin[c*x]/2]])/(2*
d^2*(c*f + g)^2*Sqrt[d - c^2*d*x^2]) + (b*(c*f - 2*g)*Sqrt[1 - c^2*x^2]*Log
[Sin[Pi/4 + ArcSin[c*x]/2]])/(2*d^2*(c*f - g)^2*Sqrt[d - c^2*d*x^2]) + (b*S
qrt[1 - c^2*x^2]*Log[Sin[Pi/4 + ArcSin[c*x]/2]])/(6*d^2*(c*f - g)*Sqrt[d -
c^2*d*x^2]) - (b*g^4*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])])/(d^2*(c*f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^
2]*Sqrt[d - c^2*d*x^2]) + (b*g^4*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*E^(I*ArcSi
n[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(d^2*(c*f - g)^2*(c*f + g)^2*Sqrt[
c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1 - c^2*x^2]*Sec[Pi/4 + ArcSi
n[c*x]/2]^2)/(24*d^2*(c*f + g)*Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(12*d^2*(c*f + g)*Sqrt[d - c^2
*d*x^2]) + ((c*f + 2*g)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Tan[Pi/4 + Ar
cSin[c*x]/2])/(4*d^2*(c*f + g)^2*Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/
(24*d^2*(c*f + g)*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3556

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4270

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_)), x_Symbol] :>
 Simp[(-b^2)*(c + d*x)*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n - 1))),
 x] + (Dist[b^2*((n - 2)/(n - 1)), Int[(c + d*x)*(b*Csc[e + f*x])^(n - 2),
x], x] - Simp[b^2*d*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /
; FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && NeQ[n, 2]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{c(a+b\arcsin(cx))}{4(cf+g)(-1+cx)^2\sqrt{1-c^2x^2}} - \frac{c(cf+2g)(a+b\arcsin(cx))}{4(cf+g)^2(-1+cx)\sqrt{1-c^2x^2}} + \frac{c(a+b\arcsin(cx))}{4(cf-g)(1+cx)^2\sqrt{1-c^2x^2}} + \frac{c(cf-2g)(a+b\operatorname{ar}}{4(cf-g)^2(1+cx)}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c(cf-2g)\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} + \frac{\left(c\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{4d^2(cf-g)\sqrt{d-c^2dx^2}} + \frac{\left(g^4\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{d^2(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}} + \frac{\left(c\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{4d^2(cf+g)\sqrt{d-c^2dx^2}} - \frac{\left(c(cf+2g)\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c(cf-2g)\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{a+bx}{c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} + \frac{\left(c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{a+bx}{(c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{4d^2(cf-g)\sqrt{d-c^2dx^2}} + \frac{\left(g^4\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{a+bx}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}} + \frac{\left(c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{a+bx}{(-c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{4d^2(cf+g)\sqrt{d-c^2dx^2}} - \frac{\left(c(cf+2g)\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{a+bx}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left((cf-2g)\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int (a+bx)\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{8d^2(cf-g)^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\operatorname{Subst}\left(\int (a+bx)\csc^4\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{16d^2(cf-g)\sqrt{d-c^2dx^2}} + \frac{\left(2g^4\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{e^{ix}(a+bx)}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\operatorname{Subst}\left(\int (a+bx)\csc^4\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{16d^2(cf+g)\sqrt{d-c^2dx^2}} + \frac{\left((cf+2g)\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int (a+bx)\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{8d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad -\frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad -\frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad +\frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\left(b(cf-2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int(a+bx)\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int(a+bx)\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(b(cf+2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(2ig^5\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\left(2ig^5\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(ibg^4\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ibg^4\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf-g)\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(bg^4\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(bg^4\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{bg^4\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{bg^4\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (warning: unable to verify)

Time = 12.89 (sec) , antiderivative size = 2078, normalized size of antiderivative = 1.60

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Result too large to show}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*((a*g - a*c^2*f*x)/(3*d^3*(-(c^2*f^2) + g^2)*(-1
+ c^2*x^2)^2) + (-3*a*g^3 - 2*a*c^4*f^3*x + 5*a*c^2*f*g^2*x)/(3*d^3*(-(c^2*
f^2) + g^2)^2*(-1 + c^2*x^2))) + (a*g^4*Log[f + g*x])/(d^(5/2)*(-(c*f) + g)
^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) - (a*g^4*Log[d*g + c^2*d*f*x + Sqrt[
d]*Sqrt[-(c^2*f^2) + g^2]*Sqrt[-(d*(-1 + c^2*x^2))]])/(d^(5/2)*(-(c*f) + g)
^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) + (b*((g*(-(c^2*f^2) + 7*g^2)*(1 - c
^2*x^2)^(3/2)*ArcSin[c*x])/(6*(-(c^2*f^2) + g^2)^2*(d*(1 - c^2*x^2))^(3/2))
 + ((4*c*f + 7*g)*(1 - c^2*x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]])/(6*(c*f + g)^2*(d*(1 - c^2*x^2))^(3/2)) + ((4*c*f - 7*g)*(1 - c^2*
x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])/(6*(c*f - g)^2*(d*
(1 - c^2*x^2))^(3/2)) + (g^4*(1 - c^2*x^2)^(3/2)*((Pi*ArcTan[(g + c*f*Tan[A
rcSin[c*x]/2])/Sqrt[c^2*f^2 - g^2]])/Sqrt[c^2*f^2 - g^2] + (2*(Pi/2 - ArcSi
n[c*x])*ArcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g
^2]] - 2*ArcCos[-((c*f)/g)]*ArcTanh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin[c*x])/
2])/Sqrt[-(c^2*f^2) + g^2]] + (ArcCos[-((c*f)/g)] - (2*I)*(ArcTanh[((c*f +
g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - ArcTanh[((-(c*f)
+ g)*Tan[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]]))*Log[Sqrt[-(c^2*
f^2) + g^2]/(Sqrt[2]*E^((I/2)*(Pi/2 - ArcSin[c*x]))*Sqrt[g]*Sqrt[c*f + c*g*
x])] + (ArcCos[-((c*f)/g)] + (2*I)*(ArcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c
*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - ArcTanh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin
[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]]))*Log[(E^((I/2)*(Pi/2 - ArcSin[c*x]))*Sq
rt[-(c^2*f^2) + g^2])/(Sqrt[2]*Sqrt[g]*Sqrt[c*f + c*g*x])] - (ArcCos[-((c*f
)/g)] + (2*I)*ArcTanh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2
*f^2) + g^2]])*Log[1 - ((c*f - I*Sqrt[-(c^2*f^2) + g^2])*(c*f + g - Sqrt[-(
c^2*f^2) + g^2]*Tan[(Pi/2 - ArcSin[c*x])/2]))/(g*(c*f + g + Sqrt[-(c^2*f^2)
 + g^2]*Tan[(Pi/2 - ArcSin[c*x])/2]))] + (-ArcCos[-((c*f)/g)] + (2*I)*ArcTa
nh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]])*Log[
1 - ((c*f + I*Sqrt[-(c^2*f^2) + g^2])*(c*f + g - Sqrt[-(c^2*f^2) + g^2]*Tan
[(Pi/2 - ArcSin[c*x])/2]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Tan[(Pi/2 -
 ArcSin[c*x])/2]))] + I*(PolyLog[2, ((c*f - I*Sqrt[-(c^2*f^2) + g^2])*(c*f
+ g - Sqrt[-(c^2*f^2) + g^2]*Tan[(Pi/2 - ArcSin[c*x])/2]))/(g*(c*f + g + Sq
rt[-(c^2*f^2) + g^2]*Tan[(Pi/2 - ArcSin[c*x])/2]))] - PolyLog[2, ((c*f + I*
Sqrt[-(c^2*f^2) + g^2])*(c*f + g - Sqrt[-(c^2*f^2) + g^2]*Tan[(Pi/2 - ArcSi
n[c*x])/2]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Tan[(Pi/2 - ArcSin[c*x])/
2]))])))/Sqrt[-(c^2*f^2) + g^2]))/((-(c*f) + g)^2*(c*f + g)^2*(d*(1 - c^2*x^
2))^(3/2)) + ((1 - c^2*x^2)^(3/2)*(-1 + ArcSin[c*x]))/(12*(c*f + g)*(d*(1 -
```

```
 c^2*x^2))^(3/2)*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) + ((1 - c^2*x
^2)^(3/2)*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(6*(c*f + g)*(d*(1 - c^2*x^2))^(3
/2)*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3) + ((1 - c^2*x^2)^(3/2)*Arc
Sin[c*x]*Sin[ArcSin[c*x]/2])/(6*(c*f - g)*(d*(1 - c^2*x^2))^(3/2)*(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^3) + ((1 - c^2*x^2)^(3/2)*(-1 - ArcSin[c*x
]))/(12*(c*f - g)*(d*(1 - c^2*x^2))^(3/2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])^2) + ((1 - c^2*x^2)^(3/2)*(4*c*f*ArcSin[c*x]*Sin[ArcSin[c*x]/2] -
7*g*ArcSin[c*x]*Sin[ArcSin[c*x]/2]))/(6*(c*f - g)^2*(d*(1 - c^2*x^2))^(3/2)
*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + ((1 - c^2*x^2)^(3/2)*(4*c*f*A
rcSin[c*x]*Sin[ArcSin[c*x]/2] + 7*g*ArcSin[c*x]*Sin[ArcSin[c*x]/2]))/(6*(c*
f + g)^2*(d*(1 - c^2*x^2))^(3/2)*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))
))/d
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 7970 vs. 2(1102) = 2204.

Time = 1.50 (sec) , antiderivative size = 7971, normalized size of antiderivative = 6.13

method	result	size
default	Expression too large to display	7971
parts	Expression too large to display	7971

```
[In] int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*g*x^7 + c^6*d^3
*f*x^6 - 3*c^4*d^3*g*x^5 - 3*c^4*d^3*f*x^4 + 3*c^2*d^3*g*x^3 + 3*c^2*d^3*f*
x^2 - d^3*g*x - d^3*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{\left(-d\,(cx-1)\,(cx+1)\right)^{\frac{5}{2}}\,(f+gx)}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(5/2)*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{b\arcsin\,(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxi
ma")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac
")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\left(f+g\,x\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)), x)
```

3.58 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1154

$$
\begin{aligned}
&\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&= \frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2}+\frac{52b^2g^3\sqrt{d-c^2dx^2}}{225c^4}-\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} \\
&+\frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2}+\frac{4abg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} \\
&+\frac{2b^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{9c^2}+\frac{26b^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4} \\
&-\frac{2b^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}+\frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&-\frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{4b^2g^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}} \\
&+\frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-\frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&-\frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} \\
&+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} \\
&-\frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2}+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+\frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} \\
&+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

```
[Out] -f^2*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+2*b*f^2*g*
x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+3/8*b*f*g^2*x
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/3*b*c*f^2*
g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*b*c*f*g
^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/4*f*g^2*
x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/3*b^2*f^2*g*(-c^2*d*x^2+d)^(
1/2)/c^2-3/32*b^2*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+26/675*b^2*g^3*(-c^2*x^2+1
)*(-c^2*d*x^2+d)^(1/2)/c^4-2/125*b^2*g^3*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2
)/c^4-1/15*g^3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/64*b^2*f*
```

```
g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+2/9*b^2*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1
/2)/c^2-3/8*f*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*b^2*f^
3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/6*f^3*(a+b*arcsin
(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+52/225*b^2*g^3*(-c^2*d
*x^2+d)^(1/2)/c^4-1/4*b^2*f^3*x*(-c^2*d*x^2+d)^(1/2)-2/15*g^3*(a+b*arcsin(c
*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4+1/2*f^3*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d
)^(1/2)+1/5*g^3*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/15*a*b*g^3*x
*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-3/64*b^2*f*g^2*arcsin(c*x)*(-c
^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/15*b^2*g^3*x*arcsin(c*x)*(-c^2*d
*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^3*x^2*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/45*b*g^3*x^3*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/25*b*c*g^3*x^5*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/8*f*g^2*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 1154, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.485$, Rules used = {4861, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795, 4715, 267,

272}

$$
\begin{aligned}
&\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&= -\frac{2bcg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{25\sqrt{1-c^2x^2}}+\frac{1}{5}g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4 \\
&\quad -\frac{3bcfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^4}{8\sqrt{1-c^2x^2}}+\frac{3}{4}fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3 \\
&\quad +\frac{2bg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{45c\sqrt{1-c^2x^2}}-\frac{2bcf^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{3\sqrt{1-c^2x^2}} \\
&\quad -\frac{3}{32}b^2fg^2\sqrt{d-c^2dx^2}x^3-\frac{g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^2}{15c^2} \\
&\quad -\frac{bcf^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{2\sqrt{1-c^2x^2}}+\frac{3bfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{8c\sqrt{1-c^2x^2}} \\
&\quad +\frac{1}{2}f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x-\frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x}{8c^2} \\
&\quad +\frac{4b^2g^3\sqrt{d-c^2dx^2}\arcsin(cx)x}{15c^3\sqrt{1-c^2x^2}}+\frac{2bf^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{c\sqrt{1-c^2x^2}} \\
&\quad -\frac{1}{4}b^2f^3\sqrt{d-c^2dx^2}x+\frac{3b^2fg^2\sqrt{d-c^2dx^2}x}{64c^2}+\frac{4abg^3\sqrt{d-c^2dx^2}x}{15c^3\sqrt{1-c^2x^2}} \\
&\quad +\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}} \\
&\quad -\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4}-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} \\
&\quad +\frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}-\frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}} \\
&\quad +\frac{52b^2g^3\sqrt{d-c^2dx^2}}{225c^4}-\frac{2b^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}+\frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2} \\
&\quad +\frac{26b^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4}+\frac{2b^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{9c^2}
\end{aligned}
$$

```
[In] Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*f^2*g*Sqrt[d - c^2*d*x^2])/(3*c^2) + (52*b^2*g^3*Sqrt[d - c^2*d*x^2]
)/(225*c^4) - (b^2*f^3*x*Sqrt[d - c^2*d*x^2])/4 + (3*b^2*f*g^2*x*Sqrt[d - c
^2*d*x^2])/(64*c^2) - (3*b^2*f*g^2*x^3*Sqrt[d - c^2*d*x^2])/32 + (4*a*b*g^3
*x*Sqrt[d - c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2*b^2*f^2*g*(1 - c^2*
x^2)*Sqrt[d - c^2*d*x^2])/(9*c^2) + (26*b^2*g^3*(1 - c^2*x^2)*Sqrt[d - c^2*
d*x^2])/(675*c^4) - (2*b^2*g^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^
4) + (b^2*f^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (3
*b^2*f*g^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (4
*b^2*g^3*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2
```

```
*b*f^2*g*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c^2*x^2]) -
 (b*c*f^3*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]
) + (3*b*f*g^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c
^2*x^2]) - (2*b*c*f^2*g*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqr
t[1 - c^2*x^2]) + (2*b*g^3*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45
*c*Sqrt[1 - c^2*x^2]) - (3*b*c*f*g^2*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(8*Sqrt[1 - c^2*x^2]) - (2*b*c*g^3*x^5*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (2*g^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x])^2)/(15*c^4) + (f^3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2
- (3*f*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) - (g^3*x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^2) + (3*f*g^2*x^3*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/c^2 + (f^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[
1 - c^2*x^2]) + (f*g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c^3*
Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
+ 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}\int \left(f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+3f^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+3fg^2x^2\sqrt{1}\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f^3\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3f^2g\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(g^3\sqrt{d-c^2dx^2}\right)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} + \frac{\left(f^3\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcf^3\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2bf^2g\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)(a+b\arcsin(cx))\,dx}{c\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(3bcfg^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(g^3\sqrt{d-c^2dx^2}\right)\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}} - \frac{\left(2bcg^3\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{5\sqrt{1-c^2x^2}}$$

$$= \frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} - \frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2f^3\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(2b^2f^2g\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3fg^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(3bfg^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4c\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(2g^3\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{15c^2\sqrt{1-c^2x^2}} + \frac{\left(2bg^3\sqrt{d-c^2dx^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{15c\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2g^3\sqrt{d-c^2dx^2}\right)\int\frac{x^5}{\sqrt{1-c^2x^2}}\,dx}{25\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} - \frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2} \\
&+ \frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}} \\
&- \frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} \\
&- \frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} \\
&- \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&- \frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} - \frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} \\
&+ \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&+ \frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2f^3\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2f^2g\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(9b^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}} - \frac{\left(3b^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2g^3\sqrt{d-c^2dx^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{45\sqrt{1-c^2x^2}} + \frac{\left(4bg^3\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{15c^3\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2g^3\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{25\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} + \frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2} + \frac{4abg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} - \frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}} - \frac{\left(b^2f^2g\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{\sqrt{1-c^2x^2}} + \frac{\left(9b^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{64c^2\sqrt{1-c^2x^2}} - \frac{\left(3b^2fg^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}} - \frac{\left(b^2g^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{45\sqrt{1-c^2x^2}} + \frac{\left(4b^2g^3\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{15c^3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2g^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^4\sqrt{1-c^2x}}-\frac{2\sqrt{1-c^2x}}{c^4}+\frac{(1-c^2x)^{3/2}}{c^4}\right)dx,x,x^2\right)}{25\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2} - \frac{2b^2g^3\sqrt{d-c^2dx^2}}{25c^4} - \frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} + \frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2} + \frac{4abg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{2b^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{9c^2} + \frac{4b^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{75c^4} - \frac{2b^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4} + \frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}} + \frac{4b^2g^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}} + \frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}} - \frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} - \frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} + \frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} - \frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} + \frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} + \frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}} - \frac{\left(b^2g^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{45\sqrt{1-c^2x^2}} - \frac{\left(4b^2g^3\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{15c^2\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2}+\frac{52b^2g^3\sqrt{d-c^2dx^2}}{225c^4}-\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2}+\frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2}$$
$$-\frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2}+\frac{4abg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{2b^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{9c^2}$$
$$+\frac{26b^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4}-\frac{2b^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}$$
$$+\frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}-\frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}$$
$$+\frac{4b^2g^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}}+\frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}$$
$$-\frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}$$
$$-\frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}$$
$$-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}$$
$$-\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4}+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2}-\frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2}$$
$$+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2}$$
$$+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 708, normalized size of antiderivative = 0.61

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{3}{4}fg^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{1}{5}g^3x^4\sqrt{1-c^2x^2}(\right.}{}$$

```
[In] Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 + (
3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
```

```
n[c*x])^2)/c^2 + (f^3*(a + b*ArcSin[c*x])^3)/(6*b*c) - (2*b*g^3*(15*a*c^5*x
^5 + b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + 15*b*c^5*x^5*ArcSin[
c*x]))/(375*c^4) - (2*b*f^2*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x
*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(9*c^2) - (b*f^3*(c*
x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/(4*c)
- (3*b*f*g^2*(8*a*c^4*x^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) + b*(-3
 + 8*c^4*x^4)*ArcSin[c*x]))/(64*c^3) + (g^3*(-9*a^2*Sqrt[1 - c^2*x^2]*(2 +
c^2*x^2) + 6*a*b*c*x*(6 + c^2*x^2) + 2*b^2*Sqrt[1 - c^2*x^2]*(20 + c^2*x^2)
 + 6*b*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2*x^2))*ArcSin[
c*x] - 9*b^2*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]^2))/(135*c^4) - (f
*g^2*(6*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*(a + b*ArcSin[c*x]
)^3)/b - 3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcS
in[c*x])))/(16*c^3)))/Sqrt[1 - c^2*x^2]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 2728, normalized size of antiderivative = 2.36

method	result	size
default	Expression too large to display	2728
parts	Expression too large to display	2728

```
[In] int((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d
/c^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c
^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))))-f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b^2*(-1/24*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(4*c^2*f
^2+3*g^2)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x
^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^
2+1)^(1/2)*x*c-1)*g^3*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c^2*x^2-1)
+3/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(
4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/864*(-d*(c^2*x^2-1))^(
1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(
1/2)*x*c+1)*g*(72*I*arcsin(c*x)*c^2*f^2+108*arcsin(c*x)^2*c^2*f^2+6*I*arcsi
n(c*x)*g^2+9*arcsin(c*x)^2*g^2-24*c^2*f^2-2*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(
c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)
^(1/2)-2*c*x)*f^3*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)-1/16*(-
d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(12*I*arcsin(c*
```

x)*c^2*f^2+6*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+arcsin(c*x)^2*g^2-12
*c^2*f^2-2*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*g*(6*arcsin(c*x)^2*c^2*f^2-12*I*arcsin(c*x)*c^2*f^2+a
rcsin(c*x)^2*g^2-2*I*arcsin(c*x)*g^2-12*c^2*f^2-2*g^2)/c^4/(c^2*x^2-1)+1/16
(-d(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x
^2+1)^(1/2)-2*c*x)*f^3*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)+1
/864*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(
-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(108*arcsin(c*x)^2*c^2*f^2-72*I*arcsin
(c*x)*c^2*f^2+9*arcsin(c*x)^2*g^2-6*I*arcsin(c*x)*g^2-24*c^2*f^2-2*g^2)/c^4
/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8
*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c
*x)*f*g^2*(-4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/4000*(-d*(
c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^
2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*g^3*
(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c^2*x^2-1))+2*a*b*(-1/16*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(4*c^2*
f^2+3*g^2)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x
^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^
2+1)^(1/2)*x*c-1)*g^3*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-
1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)
*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(4*arcsin(c*x)+I)/c^3
/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*
(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(12*I*f^2*c^2+36*arcsin(
c*x)*c^2*f^2+I*g^2+3*arcsin(c*x)*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))
^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*
x)*f^3*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2
-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(6*I*f^2*c^2+6*arcsin(c*x)*c^2*f^2+I*g^2+arc
sin(c*x)*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(
1/2)*x*c+c^2*x^2-1)*g*(6*arcsin(c*x)*c^2*f^2-6*I*f^2*c^2+arcsin(c*x)*g^2-I*
g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^3*(-I+2*arcsin(c*x))/c/(c^2*x
^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^
4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(36*arcsin(c*x)*c^2*f^2-12*I*f^
2*c^2+3*arcsin(c*x)*g^2-I*g^2)/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)
*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-1
2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(-I+4*arcsin(c*x))/c^3/(c^2*x^2
-1)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^
6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*
c^2*x^2-1)*g^3*(-I+5*arcsin(c*x))/c^4/(c^2*x^2-1))

Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g^
3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b*g
^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c^2*
d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^3\;dx$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**3, x)
```

Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^3 - 1/15*a^2*g^3
*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d))
+ 3/8*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c
^2*d) + sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a^2*f^2*g/(c^2*d)
 + sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*
f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 + 3*a*b*
f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.59 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 737

$$
\begin{aligned}
&\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx\\
&=\frac{8b^2fg\sqrt{d-c^2dx^2}}{9c^2}-\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2}+\frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2}\\
&\quad+\frac{4b^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{b^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\
&\quad-\frac{b^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}\\
&\quad-\frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}\\
&\quad-\frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}\\
&\quad+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2}\\
&\quad+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}\\
&\quad+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

```
[Out] 8/9*b^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f^2*x*(-c^2*d*x^2+d)^(1/2)+1/6
4*b^2*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+
4/27*b^2*f*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+1/2*f^2*x*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)-1/8*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/
2)/c^2+1/4*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-2/3*f*g*(-c^2*x
^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*b^2*f^2*arcsin(c*x)*
(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/64*b^2*g^2*arcsin(c*x)*(-c^2*d*
```

```
x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/3*b*f*g*x*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/8*b*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/9*b*c*f*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/8*b*c*g^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*f^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/
2)/b/c/(-c^2*x^2+1)^(1/2)+1/24*g^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)
/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 737, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {4861, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795}

$$\begin{aligned}
&\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&=-\frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} \\
&-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}-\frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+\frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} \\
&-\frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}+\frac{b^2f^2\arcsin(cx)\sqrt{d-c^2dx^2}}{4c\sqrt{1-c^2x^2}} \\
&-\frac{b^2g^2\arcsin(cx)\sqrt{d-c^2dx^2}}{64c^3\sqrt{1-c^2x^2}}-\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2}+\frac{8b^2fg\sqrt{d-c^2dx^2}}{9c^2} \\
&+\frac{4b^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2}
\end{aligned}$$

```
[In] Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*f*g*Sqrt[d - c^2*d*x^2])/(9*c^2) - (b^2*f^2*x*Sqrt[d - c^2*d*x^2])/4
 + (b^2*g^2*x*Sqrt[d - c^2*d*x^2])/(64*c^2) - (b^2*g^2*x^3*Sqrt[d - c^2*d*x
^2])/32 + (4*b^2*f*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(27*c^2) + (b^2*f^2
*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b^2*g^2*Sqrt[d
 - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (4*b*f*g*x*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*f^2*x^2*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (b*g^2*x^2*Sq
```

```
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (4*b*c*f*g
*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c*
g^2*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (f
^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - (g^2*x*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(3*c^2) + (f^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqr
t[1 - c^2*x^2]) + (g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*c^3
*Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}\int \left(f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+2fgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+g^2x^2\sqrt{1-\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f^2\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2fg\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{\left(f^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcf^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(4bfg\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3c\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcg^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}$$

$$= \frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2f^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(4b^2fg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} + \frac{\left(g^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(bg^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2} - \frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2} + \frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2f^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{4\sqrt{1-c^2x^2}} - \frac{\left(2b^2fg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(3b^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{32\sqrt{1-c^2x^2}} - \frac{\left(b^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2} + \frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2} + \frac{b^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} - \frac{\left(2b^2fg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(3b^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{64c^2\sqrt{1-c^2x^2}} - \frac{\left(b^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{16c^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{8b^2fg\sqrt{d-c^2dx^2}}{9c^2} - \frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2} + \frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2} \\
&\quad - \frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2} + \frac{4b^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2} \\
&\quad + \frac{b^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{b^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} \\
&\quad + \frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 441, normalized size of antiderivative = 0.60

$$
\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx
$$

$$
= \frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2 + \frac{1}{4}g^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2 - \frac{2fg(1-c^2x^2)^{3/2}(a+b\,\mathrm{arc}}{3c^2}\right.}{}
$$

```
[In] Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 + (
g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)^(
3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^3)/(6*b*c) -
 (4*b*f*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2) + 3*
b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(27*c^2) - (b*f^2*(c*x*(2*a*c*x + b*Sqrt
[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/(4*c) - (b*g^2*(8*a*c^4*x
^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) + b*(-3 + 8*c^4*x^4)*ArcSin[c*
x]))/(64*c^3) - (g^2*(6*b*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*(
a + b*ArcSin[c*x])^3 - 3*b^2*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 +
 2*c^2*x^2)*ArcSin[c*x]))))/(48*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.73 (sec) , antiderivative size = 1852, normalized size of antiderivative = 2.51

method	result	size
default	Expression too large to display	1852
parts	Expression too large to display	1852

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^2*
(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2))))-2/3*f*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b^2*(-1/24*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(4*c^2*f^2+
g^2)+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^
5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2
*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/108*(-d*(c^2*x^2-1))
^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)
^(1/2)*x*c+1)*f*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)+1/16*
(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x
^2+1)^(1/2)-2*c*x)*f^2*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)-1/
4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c
*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^
2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/(c^
2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*
x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/
(c^2*x^2-1)+1/108*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*
c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-6*I*arcsin(c*x)+9*arc
sin(c*x)^2-2)/c^2/(c^2*x^2-1)+1/512*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1
)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2
*x^2+1)^(1/2)+4*c*x)*g^2*(-4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-
1))+2*a*b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*
arcsin(c*x)^2*(4*c^2*f^2+g^2)+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+
1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^
2*x^2+1)^(1/2)+4*c*x)*g^2*(4*arcsin(c*x)+I)/c^3/(c^2*x^2-1)+1/36*(-d*(c^2*x
^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*
x^2+1)^(1/2)*x*c+1)*f*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2
-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-
2*c*x)*f^2*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*
x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/4*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I
)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c
```

```
^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(-I+2*arcsin(c*x))/c/(c^2*x^2-
1)+1/36*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*
I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1
)+1/256*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2*(-I
+4*arcsin(c*x))/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
+ b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin(c
*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2(f+gx)^2\,dx$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**2, x)
```

Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^2 + 1/8*a^2*g^2*
(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*
arcsin(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a^2*f*g/(c^2*d) + sqrt(d)*int
egrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int {\left(f+g\,x\right)}^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.60 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 31, antiderivative size = 396

$$\begin{aligned}\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx &= \frac{4b^2g\sqrt{d-c^2dx^2}}{9c^2}-\frac{1}{4}b^2fx\sqrt{d-c^2dx^2}\\ &+\frac{2b^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{b^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\ &+\frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\ &-\frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\ &-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 4/9*b^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f*x*(-c^2*d*x^2+d)^(1/2)+2/27*b^
2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+1/2*f*x*(a+b*arcsin(c*x))^2*(-c^2
*d*x^2+d)^(1/2)-1/3*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)
/c^2+1/4*b^2*f*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/3*b*
g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*f*x
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c*g*x^3*
(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*f*(a+b*arcsin
(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {4861, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45}

$$\begin{aligned}&\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx\\&=-\frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\&\quad+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}\\&\quad-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}\\&\quad-\frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}+\frac{b^2f\arcsin(cx)\sqrt{d-c^2dx^2}}{4c\sqrt{1-c^2x^2}}\\&\quad-\frac{1}{4}b^2fx\sqrt{d-c^2dx^2}+\frac{4b^2g\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}\end{aligned}$$

```
[In] Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*g*Sqrt[d - c^2*d*x^2])/(9*c^2) - (b^2*f*x*Sqrt[d - c^2*d*x^2])/4 + (
2*b^2*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(27*c^2) + (b^2*f*Sqrt[d - c^2*d
*x^2]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) + (2*b*g*x*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*f*x^2*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (2*b*c*g*x^3*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (f*x*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x])^2)/2 - (g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x])^2)/(3*c^2) + (f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*
Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
```

```
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{d-c^2dx^2}\int (f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(f\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(g\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}\\
&\quad+\frac{\left(f\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bcf\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(2bg\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3c\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2f\sqrt{d-c^2dx^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(2b^2g\sqrt{d-c^2dx^2}\right)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2fx\sqrt{d-c^2dx^2} + \frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2f\sqrt{d-c^2dx^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(b^2g\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2fx\sqrt{d-c^2dx^2} + \frac{b^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} - \frac{\left(b^2g\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(\frac{2}{3\sqrt{1-c^2x}} + \frac{1}{3}\sqrt{1-c^2x}\right)\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2g\sqrt{d-c^2dx^2}}{9c^2} - \frac{1}{4}b^2fx\sqrt{d-c^2dx^2} + \frac{2b^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2} + \frac{b^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.57

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d-c^2dx^2}\left(54fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2 - \frac{36g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c^2} + \frac{18f(a+b\arcsin(cx))^3}{bc} - \frac{8bg\left(b\sqrt{1-\right.}{}\right.}{}}{108\sqrt{1-c^2x}}$$

```
[In] Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(54*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (36*
g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/c^2 + (18*f*(a + b*ArcSin[c*x]
)^3)/(b*c) - (8*b*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2
*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/c^2 - (27*b*f*(c*x*(2*a*c*x +
b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/c))/(108*Sqrt[1 - c
^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 1236, normalized size of antiderivative = 3.12

method	result	size
default	Expression too large to display	1236
parts	Expression too large to display	1236

```
[In] int((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOS
E)
```

[Out] 1/2*a^2*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a^2*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*a^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))/c/(c^2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))

Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x)), x)

Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}(cx))^2\,(f+gx)\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f - 1/3*(-c^2*d*x^
2 + d)^(3/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*g*x + b^2*f)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g*x + a*b*f)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
[Out] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.61 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1442

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$
$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}}$$
$$+ \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}}$$
$$+ \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$
$$- \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$- \frac{a^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

```
[Out] a^2*(-c^2*d*x^2+d)^(1/2)/g-2*b^2*(-c^2*d*x^2+d)^(1/2)/g+2*a*b*arcsin(c*x)*(
-c^2*d*x^2+d)^(1/2)/g+b^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g-2*a*b*c*x*(-
c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-2*b^2*c*x*arcsin(c*x)*(-c^2*d*x^2+d
)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/3*c*x*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/
2)/b/g/(-c^2*x^2+1)^(1/2)-1/3*(1-c^2*f^2/g^2)*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)-a^2*arctan((c^2*f*x+g)/(c^2*f^2-
g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2
/(-c^2*x^2+1)^(1/2)+I*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g
/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-
c^2*x^2+1)^(1/2)-I*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2
*x^2+1)^(1/2)-2*I*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^
2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1
/2)-2*I*a*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g
^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)
+2*a*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*
(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+2*b^2*arcsi
n(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*
(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-2*a*b*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2
)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-2*b^2*arcsin(c*x)*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2
)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+2*I*b^2*polylog(3,I*(I*
c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-
c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+2*I*a*b*arcsin(c*x)*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2
*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)
^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/(g*x+f)
```

Rubi [A] (verified)

Time = 2.00 (sec) , antiderivative size = 1442, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.697$, Rules used = {4861, 4849, 697, 4841, 4883, 1668, 12, 739, 210, 4881, 4767, 8, 4857, 3404, 2296,

2221, 2317, 2438, 4715, 267, 2611, 2320, 6724}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$

$$= \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$

$$- \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g}$$

$$- \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g}$$

$$- \frac{a^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$+ \frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$+ \frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$+ \frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$+ \frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$+ \frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

$$- \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

```
[Out] (a^2*Sqrt[d - c^2*d*x^2])/g - (2*b^2*Sqrt[d - c^2*d*x^2])/g - (2*a*b*c*x*Sq
rt[d - c^2*d*x^2])/(g*Sqrt[1 - c^2*x^2]) + (2*a*b*Sqrt[d - c^2*d*x^2]*ArcSi
n[c*x])/g - (2*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(g*Sqrt[1 - c^2*x^2
]) + (b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/g + (c*x*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^3)/(3*b*g*Sqrt[1 - c^2*x^2]) - ((1 - (c^2*f^2)/g^2)*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*(f + g*x)*Sqrt[1 - c^2*x^2])
+ (Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*(f +
 g*x)) - (a^2*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/
(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/(g^2*Sqrt[1 - c^2*x^2]) + ((2*I)*
a*b*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*Arc
Sin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) + (I*b^2
*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcS
in[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - ((2*I)*
a*b*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*Arc
Sin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - (I*b^2
*Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcS
in[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) + (2*a*b*
Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/
(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) + (2*b^2*Sqrt[c^2*f^2
 - g^2]*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/
(c*f - Sqrt[c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - (2*a*b*Sqrt[c^2*f^2
 - g^2]*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[
c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - (2*b^2*Sqrt[c^2*f^2 - g^2]*Sqrt
[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[
c^2*f^2 - g^2])])/(g^2*Sqrt[1 - c^2*x^2]) + ((2*I)*b^2*Sqrt[c^2*f^2 - g^2]*
Sqrt[d - c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
- g^2])])/(g^2*Sqrt[1 - c^2*x^2]) - ((2*I)*b^2*Sqrt[c^2*f^2 - g^2]*Sqrt[d -
 c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
)/(g^2*Sqrt[1 - c^2*x^2])
```

<u>Rule 8</u>

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

<u>Rule 12</u>

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

<u>Rule 210</u>

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
```

```
2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{\sqrt{d-c^2dx^2}\int\frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^3}{(f+gx)^2}\,dx}{3bc\sqrt{1-c^2x^2}}$$

$$= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} + \frac{\sqrt{d-c^2dx^2}\int\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} + \frac{\sqrt{d-c^2dx^2}\int\left(-\frac{a^2(c^2f^2-g^2+c^2fgx+c^2g^2x^2)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{2ab(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{b^2(c^2f^2-g^2+c^2fgx+c^2g}{g^2(f+gx)\sqrt{1-}}\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$- \frac{\left(a^2\sqrt{d-c^2dx^2}\right)\int \frac{c^2f^2-g^2+c^2fgx+c^2g^2x^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2ab\sqrt{d-c^2dx^2}\right)\int \frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\int \frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$

$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$
$$- \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{\left(a^2\sqrt{d-c^2dx^2}\right)\int \frac{c^2g^2(c^2f^2-g^2)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{c^2g^4\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2ab\sqrt{d-c^2dx^2}\right)\int \left(\frac{c^2gx\arcsin(cx)}{\sqrt{1-c^2x^2}} + \frac{(c^2f^2-g^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\int \left(\frac{c^2gx\arcsin(cx)^2}{\sqrt{1-c^2x^2}} + \frac{(c^2f^2-g^2)\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}}$$

$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$
$$- \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$- \frac{\left(2abc^2\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)^2}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}}$$
$$- \frac{\left(a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}$$

$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g}$$
$$+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$- \frac{\left(2abc\sqrt{d-c^2dx^2}\right)\int 1\,dx}{g\sqrt{1-c^2x^2}} - \frac{\left(2b^2c\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{g\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{1}{-c^2f^2+g^2-x^2}\,dx, x, \frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{x}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{x^2}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$

$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} - \frac{\left(4ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}} - \frac{\left(2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$

$$= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{\left(4iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{\left(4iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&\quad - \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&\quad - \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf-2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2igx}{2cf+2\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&- \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} \\
&+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&- \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2\sqrt{d-c^2dx^2}}{g} - \frac{2b^2\sqrt{d-c^2dx^2}}{g} - \frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} + \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g} \\
&\quad + \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&\quad - \frac{a^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2iab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ab(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2b^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ib^2(cf-g)(cf+g)\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.97 (sec) , antiderivative size = 516, normalized size of antiderivative = 0.36

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)\,(a+b\arcsin(cx))^3+c^2gx(f+gx)(a+b\arcsin(cx))^3+g^2(1-c^2x^2)\,(a+b\arcsi}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f +
g*x)*(a + b*ArcSin[c*x])^3 + g^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^3 + 3*b*
c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*x + b*S
qrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]*((a + b*ArcSi
n[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] -
 (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(
I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*A
rcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcS
in[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(3*b*c*g^2*(f + g*x)*Sqrt[1 -
c^2*x^2])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-c^2d\,x^2+d}}{gx+f}dx$$

```
[In] int((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x)
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{gx+f}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(g*x + f), x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2}{f+gx}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2)/(g*x+f),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="ma
xima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="gi
ac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{f+g\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

3.62 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 1685

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \frac{16b^2df^2g\sqrt{d-c^2dx^2}}{25c^2}$$
$$+\frac{304b^2dg^3\sqrt{d-c^2dx^2}}{3675c^4}-\frac{15}{64}b^2df^3x\sqrt{d-c^2dx^2}-\frac{7b^2dfg^2x\sqrt{d-c^2dx^2}}{384c^2}$$
$$-\frac{43}{576}b^2dfg^2x^3\sqrt{d-c^2dx^2}+\frac{1}{36}b^2c^2dfg^2x^5\sqrt{d-c^2dx^2}$$
$$+\frac{4abdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{8b^2df^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{75c^2}$$
$$+\frac{152b^2dg^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4}-\frac{1}{32}b^2df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$
$$+\frac{6b^2df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{38b^2dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4}$$
$$-\frac{2b^2dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4}+\frac{9b^2df^3\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}$$
$$+\frac{7b^2dfg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{384c^3\sqrt{1-c^2x^2}}+\frac{4b^2dg^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{35c^3\sqrt{1-c^2x^2}}$$
$$+\frac{6bdf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+\frac{3bdfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}-\frac{4bcdf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}}$$
$$+\frac{2bdg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}}-\frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}$$
$$+\frac{6bc^3df^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{16bcdg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{6\sqrt{1-c^2x^2}}+\frac{2bc^3dg^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}$$
$$+\frac{bdf^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}-\frac{2dg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4}$$
$$+\frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}$$
$$-\frac{dg^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2}+\frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{3}{35}dg^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{1}{7}dg^3x^4\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$-\frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}$$
$$+\frac{df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}+\frac{dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{16bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 2/105*b*d*g^3*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/
2)-16/175*b*c*d*g^3*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)+2/49*b*c^3*d*g^3*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/16*d*f*g^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^
2*x^2+1)^(1/2)+4/35*a*b*d*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)
+7/384*b^2*d*f*g^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+
4/35*b^2*d*g^3*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-3/
8*b*c*d*f^3*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3
04/3675*b^2*d*g^3*(-c^2*d*x^2+d)^(1/2)/c^4-15/64*b^2*d*f^3*x*(-c^2*d*x^2+d)
^(1/2)-2/35*d*g^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4+3/8*d*f^3*x*
(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+3/35*d*g^3*x^4*(a+b*arcsin(c*x))^2
*(-c^2*d*x^2+d)^(1/2)+16/25*b^2*d*f^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-43/576*b^2
*d*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+152/11025*b^2*d*g^3*(-c^2*x^2+1)*(-c^2*d*
x^2+d)^(1/2)/c^4-1/32*b^2*d*f^3*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+38/6125
*b^2*d*g^3*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/343*b^2*d*g^3*(-c^2*x^
2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^4-1/35*d*g^3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*
x^2+d)^(1/2)/c^2+3/8*d*f*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1
/4*d*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/7*d*g^3*
x^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/2*d*f*g^2*x^3*(
-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-3/5*d*f^2*g*(-c^2*x^2+
1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+9/64*b^2*d*f^3*arcsin(c*x
)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/8*d*f^3*(a+b*arcsin(c*x))^3*(
-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+6/5*b*d*f^2*g*x*(a+b*arcsin(c*x)
)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+3/16*b*d*f*g^2*x^2*(a+b*arcsin(
c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/5*b*c*d*f^2*g*x^3*(a+b*ar
csin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/16*b*c*d*f*g^2*x^4*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+6/25*b*c^3*d*f^2*g*x
^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*b*c^3*d*f*
g^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/384*b^2
*d*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/36*b^2*c^2*d*f*g^2*x^5*(-c^2*d*x^2+d)
^(1/2)+8/75*b^2*d*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+6/125*b^2*d*f
^2*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/8*b*d*f^3*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c-3/16*d*f*g^2*x*(a+b*arcsin(c*x))^
2*(-c^2*d*x^2+d)^(1/2)/c^2
```

Rubi [A] (verified)

Time = 1.57 (sec) , antiderivative size = 1685, normalized size of antiderivative = 1.00, number of steps used = 56, number of rules used = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.818$, Rules used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712,

4787, 4783, 4795, 14, 4777, 470, 4715, 267, 272, 45, 457, 78}

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{2bc^3dg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^7}{49\sqrt{1-c^2x^2}} + \frac{bc^3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^6}{6\sqrt{1-c^2x^2}} - \frac{16bcdg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{175\sqrt{1-c^2x^2}} + \frac{6bc^3df^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{25\sqrt{1-c^2x^2}} + \frac{1}{36}b^2c^2dfg^2\sqrt{d-c^2dx^2}x^5 + \frac{3}{35}dg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4 + \frac{1}{7}dg^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4 - \frac{7bcdfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^4}{16\sqrt{1-c^2x^2}} + \frac{3}{8}dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3 + \frac{1}{2}dfg^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3 + \frac{2bdg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{105c\sqrt{1-c^2x^2}} - \frac{4bcdf^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{5\sqrt{1-c^2x^2}} - \frac{43}{576}b^2dfg^2\sqrt{d-c^2dx^2}x^3 - \frac{dg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^2}{35c^2} - \frac{3bcdf^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{8\sqrt{1-c^2x^2}} + \frac{3bdfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{16c\sqrt{1-c^2x^2}} + \frac{3}{8}df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x - \frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x}{16c^2} + \frac{1}{4}df^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x + \frac{4b^2dg^3\sqrt{d-c^2dx^2}\arcsin(cx)x}{35c^3\sqrt{1-c^2x^2}} + \frac{6bdf^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{5c\sqrt{1-c^2x^2}} - \frac{15}{64}b^2df^3\sqrt{d-c^2dx^2}x - \frac{7b^2dfg^2\sqrt{d-c^2dx^2}x}{384c^2} - \frac{1}{32}b^2df^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}x$$

```
[In] Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*f^2*g*Sqrt[d - c^2*d*x^2])/(25*c^2) + (304*b^2*d*g^3*Sqrt[d - c^2
*d*x^2])/(3675*c^4) - (15*b^2*d*f^3*x*Sqrt[d - c^2*d*x^2])/64 - (7*b^2*d*f*
g^2*x*Sqrt[d - c^2*d*x^2])/(384*c^2) - (43*b^2*d*f*g^2*x^3*Sqrt[d - c^2*d*x
^2])/576 + (b^2*c^2*d*f*g^2*x^5*Sqrt[d - c^2*d*x^2])/36 + (4*a*b*d*g^3*x*Sq
rt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) + (8*b^2*d*f^2*g*(1 - c^2*x^2
)*Sqrt[d - c^2*d*x^2])/(75*c^2) + (152*b^2*d*g^3*(1 - c^2*x^2)*Sqrt[d - c^2
*d*x^2])/(11025*c^4) - (b^2*d*f^3*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/32 +
 (6*b^2*d*f^2*g*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^2) + (38*b^2*d*
g^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(6125*c^4) - (2*b^2*d*g^3*(1 - c^2
*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^4) + (9*b^2*d*f^3*Sqrt[d - c^2*d*x^2]*A
rcSin[c*x])/(64*c*Sqrt[1 - c^2*x^2]) + (7*b^2*d*f*g^2*Sqrt[d - c^2*d*x^2]*A
rcSin[c*x])/(384*c^3*Sqrt[1 - c^2*x^2]) + (4*b^2*d*g^3*x*Sqrt[d - c^2*d*x^2
]*ArcSin[c*x])/(35*c^3*Sqrt[1 - c^2*x^2]) + (6*b*d*f^2*g*x*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (3*b*c*d*f^3*x^2*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (3*b*d*f*g^2*x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (4*b*c*
d*f^2*g*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*Sqrt[1 - c^2*x^2])
+ (2*b*d*g^3*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(105*c*Sqrt[1 - c
^2*x^2]) - (7*b*c*d*f*g^2*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*
Sqrt[1 - c^2*x^2]) + (6*b*c^3*d*f^2*g*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (16*b*c*d*g^3*x^5*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*f*g^2*x^6*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(6*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*g^3*x^7*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) + (b*d*f^3*(1 -
 c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c) - (2*d*g^3*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) + (3*d*f^3*x*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 - (3*d*f*g^2*x*Sqrt[d - c^2*d*x^2]*(a + b
*ArcSin[c*x])^2)/(16*c^2) - (d*g^3*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(35*c^2) + (3*d*f*g^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)
/8 + (3*d*g^3*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/35 + (d*f^3*x*
(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/4 + (d*f*g^2*x^3*(
1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 + (d*g^3*x^4*(1 -
 c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/7 - (3*d*f^2*g*(1 - c^
2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(5*c^2) + (d*f^3*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2]) + (d*f*g^2*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
```

```
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] && !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int(f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int\left(f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+3f^2gx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(df^3\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3df^2g\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(dg^3\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{4} d f^3 x \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin (c x))^2 \\
&+ \frac{1}{2} d f g^2 x^3 \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin (c x))^2 \\
&+ \frac{1}{7} d g^3 x^4 \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin (c x))^2 \\
&- \frac{3 d f^2 g \left(1-c^2 x^2\right)^2 \sqrt{d-c^2 d x^2} (a+b \arcsin (c x))^2}{5 c^2} \\
&+ \frac{\left(3 d f^3 \sqrt{d-c^2 d x^2}\right) \int \sqrt{1-c^2 x^2} (a+b \arcsin (c x))^2 \, dx}{4 \sqrt{1-c^2 x^2}} \\
&- \frac{\left(b c d f^3 \sqrt{d-c^2 d x^2}\right) \int x \left(1-c^2 x^2\right) (a+b \arcsin (c x)) \, dx}{2 \sqrt{1-c^2 x^2}} \\
&+ \frac{\left(6 b d f^2 g \sqrt{d-c^2 d x^2}\right) \int \left(1-c^2 x^2\right)^2 (a+b \arcsin (c x)) \, dx}{5 c \sqrt{1-c^2 x^2}} \\
&+ \frac{\left(3 d f g^2 \sqrt{d-c^2 d x^2}\right) \int x^2 \sqrt{1-c^2 x^2} (a+b \arcsin (c x))^2 \, dx}{2 \sqrt{1-c^2 x^2}} \\
&- \frac{\left(b c d f g^2 \sqrt{d-c^2 d x^2}\right) \int x^3 \left(1-c^2 x^2\right) (a+b \arcsin (c x)) \, dx}{\sqrt{1-c^2 x^2}} \\
&+ \frac{\left(3 d g^3 \sqrt{d-c^2 d x^2}\right) \int x^3 \sqrt{1-c^2 x^2} (a+b \arcsin (c x))^2 \, dx}{7 \sqrt{1-c^2 x^2}} \\
&- \frac{\left(2 b c d g^3 \sqrt{d-c^2 d x^2}\right) \int x^4 \left(1-c^2 x^2\right) (a+b \arcsin (c x)) \, dx}{7 \sqrt{1-c^2 x^2}}
\end{aligned}
$$

$$= \frac{6bdf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}}$$
$$- \frac{bcdfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4\sqrt{1-c^2x^2}}$$
$$+ \frac{6bc^3df^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}$$
$$- \frac{2bcdg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} + \frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{6\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^3dg^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}$$
$$+ \frac{bdf^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}$$
$$+ \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{3}{35}dg^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{7}dg^3x^4\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$- \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}$$
$$+ \frac{\left(3df^3\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2df^3\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\,dx}{8\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3bcdf^3\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}$$
$$- \frac{\left(6b^2df^2g\sqrt{d-c^2dx^2}\right)\int\frac{x(15-10c^2x^2+3c^4x^4)}{15\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3bcdfg^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(b^2c^2dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4(3-2c^2x^2)}{12\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3dg^3\sqrt{d-c^2dx^2}\right)\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{35\sqrt{1-c^2x^2}}$$
$$- \frac{\left(6bcdg^3\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{35\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2b^2c^2dg^3\sqrt{d-c^2dx^2}\right)\int\frac{x^5(7-5c^2x^2)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{1}{32}b^2df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{6bdf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcdf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{4bcdf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}} \\
&\quad - \frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} \\
&\quad + \frac{6bc^3df^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&\quad - \frac{16bcdg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{6\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dg^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad + \frac{bdf^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} \\
&\quad - \frac{dg^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} + \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{3}{35}dg^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{7}dg^3x^4\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&\quad + \frac{df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2df^3\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{32\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3b^2c^2df^3\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2df^2g\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{25\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3bdfg^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{8c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(3-2c^2x^2\right)}{\sqrt{1-c^2x^2}}\,dx}{12\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2dfg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2dg^3\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{35c^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

= Too large to display

Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 872, normalized size of antiderivative = 0.52

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\left(3087000a^3cf(2c^2f^2+g^2)-88200a^2b\sqrt{1-c^2x^2}(32g^3+c^2g(336f^2+105\right.}{}$$

```
[In] Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f*(2*c^2*f^2 + g^2) - 88200*a^2*b*Sqr
t[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x
^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 3
36*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + 840*a*b^2*c*x*(6720*g^3 + 35*c^
2*g*(2016*f^2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^2*g*x
 + 1225*f*g^2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x + 490
0*f*g^2*x^2 + 1200*g^3*x^3)) + b^3*Sqrt[1 - c^2*x^2]*(4785152*g^3 + c^2*g*(
39250176*f^2 - 900375*f*g*x - 429824*g^2*x^2) + 4*c^6*x^3*(385875*f^3 + 592
704*f^2*g*x + 343000*f*g^2*x^2 + 72000*g^3*x^3) - 2*c^4*x*(6559875*f^3 + 50
05056*f^2*g*x + 1843625*f*g^2*x^2 + 278784*g^3*x^3)) + 105*b*(88200*a^2*c*f
*(2*c^2*f^2 + g^2) - 1680*a*b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 +
105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 2
0*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3))
+ b^2*c*(35*g^2*(245*f + 1536*g*x) + 70*c^2*(1785*f^3 + 8064*f^2*g*x + 1260
*f*g^2*x^2 + 128*g^3*x^3) - 168*c^4*x^2*(1750*f^3 + 2240*f^2*g*x + 1225*f*g
^2*x^2 + 256*g^3*x^3) + 16*c^6*x^4*(3675*f^3 + 7056*f^2*g*x + 4900*f*g^2*x^
2 + 1200*g^3*x^3)))*ArcSin[c*x] - 88200*b^2*(-105*a*c*f*(2*c^2*f^2 + g^2) +
 b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4
*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f
^3 + 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)))*ArcSin[c*x]^2 + 3087000*b^
3*c*f*(2*c^2*f^2 + g^2)*ArcSin[c*x]^3))/(49392000*b*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.05 (sec) , antiderivative size = 4176, normalized size of antiderivative = 2.48

method	result	size
default	Expression too large to display	4176
parts	Expression too large to display	4176

[In] int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERB
OSE)

[Out] a^2*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*
d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*x^
2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-1/6
x(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/
2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2)))))-3/5*f^2*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b^2*(-1/16*(-d*(c^2
x^2-1))^(1/2)(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(2*c^2*f^
2+g^2)*d-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^
7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^
2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g^3*(14*I*a
rcsin(c*x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/2304*(-d*(c^2*x^2-1))^(1
/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^
4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^
(1/2)-6*c*x)*f*g^2*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)-1
/16000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2
)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)
*x*c-1)*g*(300*arcsin(c*x)^2*c^2*f^2+120*I*arcsin(c*x)*c^2*f^2-25*arcsin(c*
x)^2*g^2-10*I*arcsin(c*x)*g^2-24*c^2*f^2+2*g^2)*d/c^4/(c^2*x^2-1)-1/1024*(-
d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x
^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(8*I*arcsin(c*
x)*c^2*f^2+16*arcsin(c*x)^2*c^2*f^2-12*I*arcsin(c*x)*g^2-24*arcsin(c*x)^2*g
^2-2*c^2*f^2+3*g^2)*d/c^3/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2
-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(8*arcsin(c*x)^2*c^2*f^2+16*I*arcsin(c*x)*c^
2*f^2+arcsin(c*x)^2*g^2+2*I*arcsin(c*x)*g^2-16*c^2*f^2-2*g^2)*d/c^4/(c^2*x^
2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(8
*arcsin(c*x)^2*c^2*f^2-16*I*arcsin(c*x)*c^2*f^2+arcsin(c*x)^2*g^2-2*I*arcsi
n(c*x)*g^2-16*c^2*f^2-2*g^2)*d/c^4/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)
*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-
32*I*arcsin(c*x)*c^2*f^2+32*arcsin(c*x)^2*c^2*f^2-6*I*arcsin(c*x)*g^2+6*arc
sin(c*x)^2*g^2-16*c^2*f^2-3*g^2)*d/c^3/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^
(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-
5*c^2*x^2+1)*g*(108*arcsin(c*x)^2*c^2*f^2-72*I*arcsin(c*x)*c^2*f^2+9*arcsin
(c*x)^2*g^2-6*I*arcsin(c*x)*g^2-24*c^2*f^2-2*g^2)*d/c^4/(c^2*x^2-1)-1/2304*
(-d*(c^2*x^2-1))^(1/2)*(32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7-48*I*(-c
^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5+18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x
^3-I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(-6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*
d/c^3/(c^2*x^2-1)-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)
^(1/2)+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*g^
3*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/36000*(-d*(c^2
x^2-1))^(1/2)(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(1980*I*arcsin(c*x)*c
^2*f^2+4050*arcsin(c*x)^2*c^2*f^2+210*I*arcsin(c*x)*g^2+225*arcsin(c*x)^2*g

^2-804*c^2*f^2-58*g^2)*cos(4*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/72000*(-d*(c^
2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(5040*I*arcsin(c*x)*
c^2*f^2+5400*arcsin(c*x)^2*c^2*f^2+330*I*arcsin(c*x)*g^2+675*arcsin(c*x)^2*
g^2-1392*c^2*f^2-134*g^2)*sin(4*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/1024*(-d*(
c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(136*I*arcsin(c*x)
*c^2*f^2+112*arcsin(c*x)^2*c^2*f^2+12*I*arcsin(c*x)*g^2+48*arcsin(c*x)^2*g^
2-62*c^2*f^2-15*g^2)*cos(3*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/1024*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(40*I*arcsin(c*x)*c^2*f
^2+48*arcsin(c*x)^2*c^2*f^2+12*I*arcsin(c*x)*g^2-22*c^2*f^2-3*g^2)*sin(3*ar
csin(c*x))*d/c^3/(c^2*x^2-1))+2*a*b*(-3/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2*f^2+g^2)*d-1/6272*(-d*(c^2
x^2-1))^(1/2)(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*
c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)
*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g^3*(I+7*arcsin(c*x))*d/c^4/(c^2*x^2
-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x
^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c
^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(I+6*arcsin(c*x))*d/c^3/(c^
2*x^2-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^
2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2
+1)^(1/2)*x*c-1)*g*(12*I*f^2*c^2+60*arcsin(c*x)*c^2*f^2-I*g^2-5*arcsin(c*x)
*g^2)*d/c^4/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/
2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+
1)^(1/2)+4*c*x)*f*(2*I*c^2*f^2+8*arcsin(c*x)*c^2*f^2-3*I*g^2-12*arcsin(c*x)
*g^2)*d/c^3/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1
)^(1/2)*x*c-1)*g*(8*I*c^2*f^2+8*arcsin(c*x)*c^2*f^2+I*g^2+arcsin(c*x)*g^2)*
d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^
2*x^2-1)*g*(8*arcsin(c*x)*c^2*f^2-8*I*c^2*f^2+arcsin(c*x)*g^2-I*g^2)*d/c^4/
(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*
c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-16*I*c^2*f^2+32*arcsin(c*x)*c^2*f^2
-3*I*g^2+6*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*
(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*
x^2+1)*g*(36*arcsin(c*x)*c^2*f^2-12*I*f^2*c^2+3*arcsin(c*x)*g^2-I*g^2)*d/c^
4/(c^2*x^2-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6
+32*c^7*x^7-48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5+18*I*(-c^2*x^2+1)^(1
/2)*x^2*c^2+38*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(-I+6*arcsin(c*x))
*d/c^3/(c^2*x^2-1)-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)
^(1/2)+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*g^
3*(-I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(66*I*c^2*f^2+270*arcsin(c*x)*c^2*f^2+7*I*
g^2+15*arcsin(c*x)*g^2)*cos(4*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/4800*(-d*(c^
2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(168*I*c^2*f^2+360*a
rcsin(c*x)*c^2*f^2+11*I*g^2+45*arcsin(c*x)*g^2)*sin(4*arcsin(c*x))*d/c^4/(c
^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)
f(34*I*c^2*f^2+56*arcsin(c*x)*c^2*f^2+3*I*g^2+24*arcsin(c*x)*g^2)*cos(3*a

```
rcsin(c*x))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^
(1/2)*x*c+c^2*x^2-1)*f*(10*I*c^2*f^2+24*arcsin(c*x)*c^2*f^2+3*I*g^2)*sin(3*
arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*c^2*d*g^3*x^5 + 3*a^2*c^2*d*f*g^2*x^4 - 3*a^2*d*f^2*g*x - a^
2*d*f^3 + (3*a^2*c^2*d*f^2*g - a^2*d*g^3)*x^3 + (a^2*c^2*d*f^3 - 3*a^2*d*f*
g^2)*x^2 + (b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4 - 3*b^2*d*f^2*g*x - b
^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^2*c^2*d*f^3 - 3*b^2*d*f
*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^4 - 3
*a*b*d*f^2*g*x - a*b*d*f^3 + (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a*b*c^2
*d*f^3 - 3*a*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
maxima")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a^2*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2
*d*x^2 + d)^(5/2)/(c^4*d))*a^2*g^3 + 1/16*a^2*f*g^2*(2*(-c^2*d*x^2 + d)^(3/
2)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/
c^2 + 3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f^2*g/(c^
2*d) + sqrt(d)*integrate(-((b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4 - 3*b
^2*d*f^2*g*x - b^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^2*c^2*d
*f^3 - 3*b^2*d*f*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2
*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^4 - 3*a*b*d*f^2*g*x - a*b*d*f^3 +
 (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a*b*c^2*d*f^3 - 3*a*b*d*f*g^2)*x^2)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1),
x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 (d - c^2dx^2)^{3/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.63 $\int (f+gx)^2 (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))^2 dx$

Optimal result

Integrand size = 33, antiderivative size = 1108

$$\int (f+gx)^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2}-\frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2}-\frac{7b^2dg^2x\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2}+\frac{16b^2dfg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}-\frac{1}{32}b^2df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{4b^2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}+\frac{7b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}}+\frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+\frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}-\frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}-\frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}+\frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}+\frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}+\frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}+\frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}+\frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}+\frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/18*b*c^3*d*g^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)+1/16*b*d*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^
(1/2)-7/48*b*c*d*g^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)-3/8*b*c*d*f^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)-15/64*b^2*d*f^2*x*(-c^2*d*x^2+d)^(1/2)-43/1728*b^2*d*g^2*x^3*(-c^2
*d*x^2+d)^(1/2)+3/8*d*f^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/8*d*
g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/6*d*g^2*x^3*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+32/75*b^2*d*f*g*(-c^2*d*x^2+d)^(1
/2)/c^2-7/1152*b^2*d*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/108*b^2*c^2*d*g^2*x^5
*(-c^2*d*x^2+d)^(1/2)-1/32*b^2*d*f^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/
16*d*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*d*f^2*x*(-c^2*x
^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+16/225*b^2*d*f*g*(-c^2*x^2+1
)*(-c^2*d*x^2+d)^(1/2)/c^2+4/125*b^2*d*f*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1
/2)/c^2+1/8*b*d*f^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/c-2/5*d*f*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+
9/64*b^2*d*f^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+7/1152
*b^2*d*g^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/8*d*f^
2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+1/48*d*g^
2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)+4/5*b*d
*f*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-8/15*b*c
*d*f*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/25*b
*c^3*d*f*g*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 1108, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.636$, Rules used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712,

4787, 4783, 4795, 14, 4777, 470}

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{bc^3dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^6}{18\sqrt{1-c^2x^2}} + \frac{4bc^3dfg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{25\sqrt{1-c^2x^2}} + \frac{1}{108}b^2c^2dg^2\sqrt{d-c^2dx^2}x^5 - \frac{7bcdg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^4}{48\sqrt{1-c^2x^2}} + \frac{1}{8}dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3 + \frac{1}{6}dg^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3 - \frac{8bcdfg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{15\sqrt{1-c^2x^2}} - \frac{43b^2dg^2\sqrt{d-c^2dx^2}x^3}{1728} - \frac{3bcdf^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{8\sqrt{1-c^2x^2}} + \frac{bdg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{16c\sqrt{1-c^2x^2}} + \frac{3}{8}df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x - \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x}{16c^2} + \frac{1}{4}df^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x + \frac{4bdfg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{5c\sqrt{1-c^2x^2}} - \frac{15}{64}b^2df^2\sqrt{d-c^2dx^2}x - \frac{7b^2dg^2\sqrt{d-c^2dx^2}x}{1152c^2} - \frac{1}{32}b^2df^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}x + \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} + \frac{7b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}} + \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{4b^2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} + \frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2} + \frac{16b^2dfg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}$$

```
[In] Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*f*g*Sqrt[d - c^2*d*x^2])/(75*c^2) - (15*b^2*d*f^2*x*Sqrt[d - c^2*
d*x^2])/64 - (7*b^2*d*g^2*x*Sqrt[d - c^2*d*x^2])/(1152*c^2) - (43*b^2*d*g^2
*x^3*Sqrt[d - c^2*d*x^2])/1728 + (b^2*c^2*d*g^2*x^5*Sqrt[d - c^2*d*x^2])/10
8 + (16*b^2*d*f*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(225*c^2) - (b^2*d*f^2
*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/32 + (4*b^2*d*f*g*(1 - c^2*x^2)^2*Sqr
t[d - c^2*d*x^2])/(125*c^2) + (9*b^2*d*f^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])
/(64*c*Sqrt[1 - c^2*x^2]) + (7*b^2*d*g^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(
1152*c^3*Sqrt[1 - c^2*x^2]) + (4*b*d*f*g*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (3*b*c*d*f^2*x^2*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (b*d*g^2*x^2*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (8*b*c*d*f*g*x^3*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) - (7*b*c*d*g^2*x^4*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (4*b*c^3*d*
f*g*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + (
b*c^3*d*g^2*x^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c^2*x
^2]) + (b*d*f^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
)/(8*c) + (3*d*f^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 - (d*g^2*
x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (d*g^2*x^3*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 + (d*f^2*x*(1 - c^2*x^2)*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^2)/4 + (d*g^2*x^3*(1 - c^2*x^2)*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/6 - (2*d*f*g*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/(5*c^2) + (d*f^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2]) + (d*g^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x])^3)/(48*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
```

```
IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
```

```
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int (f+gx)^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \Big(f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+2fgx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+g^2}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(df^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2dfg\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int x^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{\left(3df^2\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcdf^2\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(4bdfg\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{5c\sqrt{1-c^2x^2}} + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bcdg^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{12\sqrt{1-c^2x^2}} + \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&\quad + \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&\quad + \frac{\left(3df^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2df^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(3bcdf^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(4b^2dfg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{15\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcdg^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{1}{32}b^2df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&\quad + \frac{bdf^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} \\
&\quad + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&\quad + \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2df^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{32\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3b^2c^2df^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(4b^2dfg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{75\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(dg^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(bdg^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{8c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(3-2c^2x^2\right)}{\sqrt{1-c^2x^2}}\,dx}{36\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2} - \frac{1}{64}b^2dg^2x^3\sqrt{d-c^2dx^2} + \frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2} \\
&- \frac{1}{32}b^2df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&- \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} \\
&- \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} \\
&+ \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&+ \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} \\
&+ \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&+ \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} \\
&- \frac{\left(3b^2df^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} + \frac{\left(3b^2df^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2dfg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{75\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{27\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2} + \frac{b^2dg^2x\sqrt{d-c^2dx^2}}{128c^2} - \frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728} \\
&+ \frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2} - \frac{1}{32}b^2df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} \\
&+ \frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&- \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} \\
&- \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} \\
&+ \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&+ \frac{bdf^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} \\
&+ \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&+ \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2dfg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{8}{\sqrt{1-c^2x}}+4\sqrt{1-c^2x}+3(1-c^2x)^{3/2}\right)dx,x,x^2\right)}{75\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{36\sqrt{1-c^2x^2}} + \frac{\left(3b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2} - \frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2} - \frac{7b^2dg^2x\sqrt{d-c^2dx^2}}{1152c^2} - \frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2} + \frac{16b^2dfg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} - \frac{1}{32}b^2df^2x(1-c^2x^2)\sqrt{d-c^2dx^2} + \frac{4b^2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} + \frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} - \frac{b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{128c^3\sqrt{1-c^2x^2}} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} + \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}df^2x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}dg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2dg^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{72c^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2} - \frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2} - \frac{7b^2dg^2x\sqrt{d-c^2dx^2}}{1152c^2} \\
&\quad - \frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2} \\
&\quad + \frac{16b^2dfg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} - \frac{1}{32}b^2df^2x(1-c^2x^2)\sqrt{d-c^2dx^2} \\
&\quad + \frac{4b^2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} + \frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} \\
&\quad + \frac{7b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} \\
&\quad - \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&\quad + \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} \\
&\quad + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}df^2x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}dg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&\quad + \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 616, normalized size of antiderivative = 0.56

$$
\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a + b\arcsin(cx))^2 \, dx = \frac{d\sqrt{d-c^2dx^2}\Big(9000a^3(6c^2f^2+g^2) + 120ab^2c^2x(450c^2f^2x(-5+c^2x^2) + 192fg(15-10c^2
$$

```
[In] Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(9000*a^3*(6*c^2*f^2 + g^2) + 120*a*b^2*c^2*x*(450*c
^2*f^2*x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*x*
(9 - 21*c^2*x^2 + 8*c^4*x^4)) - 1800*a^2*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1
+ c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*
c^4*x^4)) + b^3*c*Sqrt[1 - c^2*x^2]*(6750*c^2*f^2*x*(-17 + 2*c^2*x^2) + 153
6*f*g*(149 - 38*c^2*x^2 + 9*c^4*x^4) + 125*g^2*x*(-21 - 86*c^2*x^2 + 32*c^4
*x^4)) + 15*b*(1800*a^2*(6*c^2*f^2 + g^2) + b^2*(175*g^2 + 90*c^2*(85*f^2 +
 256*f*g*x + 20*g^2*x^2) - 120*c^4*x^2*(150*f^2 + 128*f*g*x + 35*g^2*x^2) +
 16*c^6*x^4*(225*f^2 + 288*f*g*x + 100*g^2*x^2)) - 240*a*b*c*Sqrt[1 - c^2*x
^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 -
 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*(6*c^2*f^2 + g^2) -
 b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*
x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x]^2 + 9000*b^3*(6*c
^2*f^2 + g^2)*ArcSin[c*x]^3))/(432000*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.93 (sec) , antiderivative size = 3032, normalized size of antiderivative = 2.74

method	result	size
default	Expression too large to display	3032
parts	Expression too large to display	3032

```
[In] int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*
d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*x*
(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x
*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^
2+d)^(1/2)))))-2/5*f*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b^2*(-1/48*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(6*c^2*f^2+g^2)*
d-1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^
7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^
2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(6*I*arcsin(c*x)+18*arcsin(c*x
)^2-1)*d/c^3/(c^2*x^2-1)-1/2000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x
^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c
^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*
d/c^2/(c^2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^
4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1
/2)+4*c*x)*(8*I*arcsin(c*x)*c^2*f^2+16*arcsin(c*x)^2*c^2*f^2-4*I*arcsin(c*x
)*g^2-8*arcsin(c*x)^2*g^2-2*c^2*f^2+g^2)*d/c^3/(c^2*x^2-1)-1/8*(-d*(c^2*x^2
-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)^2-2+2*I*ar
```

csin(c*x))*d/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)+1
/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c
^2*x^2+1)^(1/2)-2*c*x)*(-32*I*arcsin(c*x)*c^2*f^2+32*arcsin(c*x)^2*c^2*f^2-
2*I*arcsin(c*x)*g^2+2*arcsin(c*x)^2*g^2-16*c^2*f^2-g^2)*d/c^3/(c^2*x^2-1)+1
/144*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(
-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)
*d/c^2/(c^2*x^2-1)-1/6912*(-d*(c^2*x^2-1))^(1/2)*(32*I*(-c^2*x^2+1)^(1/2)*c
^6*x^6+32*c^7*x^7-48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5+18*I*(-c^2*x^2
+1)^(1/2)*x^2*c^2+38*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(-6*I*arcsin(c
*x)+18*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)-1/9000*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(330*I*arcsin(c*x)+675*arcsin(c*x)^2-
134)*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/4500*(-d*(c^2*x^2-1))^(1/2)*(I*
c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(210*I*arcsin(c*x)+225*arcsin(c*x)^2-
58)*sin(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c
^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(136*I*arcsin(c*x)*c^2*f^2+112*arcsin(c*x)
^2*c^2*f^2+4*I*arcsin(c*x)*g^2+16*arcsin(c*x)^2*g^2-62*c^2*f^2-5*g^2)*cos(3
*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+
1)^(1/2)*x*c+c^2*x^2-1)*(40*I*arcsin(c*x)*c^2*f^2+48*arcsin(c*x)^2*c^2*f^2+
4*I*arcsin(c*x)*g^2-22*c^2*f^2-g^2)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))+2
*a*b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsi
n(c*x)^2*(6*c^2*f^2+g^2)*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1
)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*
(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(I+6*
arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/400*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*
c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*
x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-
1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+
8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(8*ar
csin(c*x)*c^2*f^2+2*I*c^2*f^2-4*arcsin(c*x)*g^2-I*g^2)*d/c^3/(c^2*x^2-1)-1/
8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c
*x)+I)*d/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x
*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^
(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)
*(-16*I*c^2*f^2+32*arcsin(c*x)*c^2*f^2-I*g^2+2*arcsin(c*x)*g^2)*d/c^3/(c^2*
x^2-1)+1/48*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^
4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))*d/c^2/(c^2
x^2-1)-1/2304(-d*(c^2*x^2-1))^(1/2)*(32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c
^7*x^7-48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5+18*I*(-c^2*x^2+1)^(1/2)*x
^2*c^2+38*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(-I+6*arcsin(c*x))*d/c^3/
(c^2*x^2-1)-1/600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*f*g*(11*I+45*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/300*(-d
*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(7*I+15*arcsin
(c*x))*sin(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I
*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(34*I*c^2*f^2+56*arcsin(c*x)*c^2*f^2+I*g

```
^2+8*arcsin(c*x)*g^2)*cos(3*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(10*I*c^2*f^2+24*arcsin(c
*x)*c^2*f^2+I*g^2)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^2 (b\arcsin(cx)+a)^2 \, dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*c^2*d*g^2*x^4 + 2*a^2*c^2*d*f*g*x^3 - 2*a^2*d*f*g*x - a^2*d*
f^2 + (a^2*c^2*d*f^2 - a^2*d*g^2)*x^2 + (b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*f*
g*x^3 - 2*b^2*d*f*g*x - b^2*d*f^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arcsin
(c*x)^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x - a*b*
d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d),
 x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^2 (b\arcsin(cx)+a)^2 \, dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
maxima")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a^2*f^2 + 1/48*a^2*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c
```

```
^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*
arcsin(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f*g/(c^2*d) + sqrt(d)*int
egrate(-((b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*f*g*x^3 - 2*b^2*d*f*g*x - b^2*d*f
^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1))^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x - a*b*
d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \int {\left(f+g\,x\right)}^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2} \,d x$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.64 $\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 31, antiderivative size = 621

$$\begin{aligned}\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx &= \frac{16b^2dg\sqrt{d-c^2dx^2}}{75c^2} \\ &-\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2}+\frac{8b^2dg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} \\ &-\frac{1}{32}b^2dfx(1-c^2x^2)\sqrt{d-c^2dx^2}+\frac{2b^2dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} \\ &+\frac{9b^2df\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}+\frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\ &-\frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\ &+\frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\ &+\frac{bdf(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\ &+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\ &+\frac{1}{4}dfx(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\ &-\frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\ &+\frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 16/75*b^2*d*g*(-c^2*d*x^2+d)^(1/2)/c^2-15/64*b^2*d*f*x*(-c^2*d*x^2+d)^(1/2)
+8/225*b^2*d*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*d*f*x*(-c^2*x
^2+1)*(-c^2*d*x^2+d)^(1/2)+2/125*b^2*d*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2
```

```
)/c^2+1/8*b*d*f*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
+3/8*d*f*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/4*d*f*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-1/5*d*g*(-c^2*x^2+1)^2*(a+b*arcsin
(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+9/64*b^2*d*f*arcsin(c*x)*(-c^2*d*x^2+d)^(
1/2)/c/(-c^2*x^2+1)^(1/2)+2/5*b*d*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)/c/(-c^2*x^2+1)^(1/2)-3/8*b*c*d*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*g*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+1/8*d*f*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/
c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 621, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.484, Rules used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712}

$$\begin{aligned}
&\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\\
&-\frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\
&+\frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\
&+\frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}\\
&+\frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}\\
&+\frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}\\
&-\frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}\\
&-\frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}\\
&+\frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}\\
&+\frac{9b^2df\arcsin(cx)\sqrt{d-c^2dx^2}}{64c\sqrt{1-c^2x^2}}-\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2}\\
&-\frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{2b^2dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}}{125c^2}\\
&+\frac{16b^2dg\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2dg\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{225c^2}
\end{aligned}$$

```
[In] Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*g*Sqrt[d - c^2*d*x^2])/(75*c^2) - (15*b^2*d*f*x*Sqrt[d - c^2*d*x^
2])/64 + (8*b^2*d*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(225*c^2) - (b^2*d*f
*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/32 + (2*b^2*d*g*(1 - c^2*x^2)^2*Sqrt[
d - c^2*d*x^2])/(125*c^2) + (9*b^2*d*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64
*c*Sqrt[1 - c^2*x^2]) + (2*b*d*g*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(5*c*Sqrt[1 - c^2*x^2]) - (3*b*c*d*f*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (4*b*c*d*g*x^3*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*g*x^5*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + (b*d*f*(1 - c^2*x^2)^(3/2)*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (3*d*f*x*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/8 + (d*f*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b
*ArcSin[c*x])^2)/4 - (d*g*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2)/(5*c^2) + (d*f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c*
Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
```

```
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(f(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+gx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(df\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(dg\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{\left(3df\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bcdf\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(2bdg\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{5c\sqrt{1-c^2x^2}}$$

$$= \frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bdf(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{\left(3df\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2df\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(3bcdf\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(2b^2dg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{15\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2df\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{32\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2df\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(2b^2dg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{75\sqrt{1-c^2x^2}}$$

$$= -\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2} - \frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2df\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} + \frac{\left(3b^2df\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} - \frac{\left(b^2dg\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{75\sqrt{1-c^2x^2}}$$

$$=-\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2}-\frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{9b^2df\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}+\frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}+\frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}-\frac{\left(b^2dg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{8}{\sqrt{1-c^2x}}+4\sqrt{1-c^2x}+3(1-c^2x)^{3/2}\right)dx,x,x^2\right)}{75\sqrt{1-c^2x^2}}$$

$$=\frac{16b^2dg\sqrt{d-c^2dx^2}}{75c^2}-\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2}+\frac{8b^2dg\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{225c^2}-\frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{2b^2dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{9b^2df\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}+\frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{dg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}+\frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 395, normalized size of antiderivative = 0.64

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(9000a^3cf-1800a^2b\sqrt{1-c^2x^2}\Big(8g\left(-1+c^2x^2\right)^2+5c^2fx\left(-5+2c^2x^2\right)\Big)-\cdots}{\cdots}$$

[In] Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]

[Out] (d*Sqrt[d - c^2*d*x^2]*(9000*a^3*c*f - 1800*a^2*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 + c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + 120*a*b^2*c*x*(75*c^2*f*x*(-5 + c^2*x^2) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + b^3*Sqrt[1 - c^2*x^2]*(1125*c^2*f*x*(-17 + 2*c^2*x^2) + 128*g*(149 - 38*c^2*x^2 + 9*c^4*x^4)) + 15*b*(1800*a^2*c*f - 240*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 + c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*(128*g*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 75*f*(17 - 40*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*c*f + b*Sqrt[1 - c^2*x^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*ArcSin[c*x]^2 + 9000*b^3*c*f*ArcSin[c*x]^3))/(72000*b*c^2*Sqrt[1 - c^2*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.80 (sec) , antiderivative size = 2021, normalized size of antiderivative = 3.25

method	result	size
default	Expression too large to display	2021
parts	Expression too large to display	2021

[In] int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/4*a^2*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a^2*f*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^2*f*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a^2*g/c^2/d*(-c^2*d*x^2+d)^(5/2)+b^2*(-1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f*d-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(

```
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^2/
(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c
^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d
/c/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)
+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6*I*arcsin(c*x)+9*ar
csin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/18000*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^
2+1)^(1/2)*x*c+c^2*x^2-1)*g*(330*I*arcsin(c*x)+675*arcsin(c*x)^2-134)*cos(4
*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/9000*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*
x*(-c^2*x^2+1)^(1/2)-I)*g*(210*I*arcsin(c*x)+225*arcsin(c*x)^2-58)*sin(4*ar
csin(c*x))*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-
c^2*x^2+1)^(1/2)-I)*f*(68*I*arcsin(c*x)+56*arcsin(c*x)^2-31)*cos(3*arcsin(c
*x))*d/c/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c
+c^2*x^2-1)*f*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*sin(3*arcsin(c*x))*d/c
/(c^2*x^2-1))+2*a*b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2
*x^2-1)*arcsin(c*x)^2*f*d-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x
^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c
^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/25
6*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*arcsin(
c*x)+I)*d/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*g*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)
+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-
c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)+1/96*(-d*(c^2*
x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1
/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/1200*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(11*I+45*arcsin(c*x))
*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x
^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d/c^
2/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2
)-I)*f*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/c/(c^2*x^2-1)+3/256*(-d*(
c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(5*I+12*arcsin(c*x
))*sin(3*arcsin(c*x))*d/c/(c^2*x^2-1))
```

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fr
icas")
```

```
[Out] integral(-(a^2*c^2*d*g*x^3 + a^2*c^2*d*f*x^2 - a^2*d*g*x - a^2*d*f + (b^2*c
^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arcsin(c*x)^2 + 2*(a*b*
c^2*d*g*x^3 + a*b*c^2*d*f*x^2 - a*b*d*g*x - a*b*d*f)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int\left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2\,(f+gx)\,dx$$

```
[In] integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="ma
xima")
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a^2*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2*g/(c^2*d) + sqrt(d)*int
egrate(-((b^2*c^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*g*x^3 + a*b*c^2*d*f*x^2
 - a*b*d*g*x - a*b*d*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="gi
ac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
[Out] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.65 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1992

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} + \frac{2b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} + \frac{2abcd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}}{g^3\sqrt{1-c^2x^2}} - \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} - \frac{2abd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} + \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} + \frac{2b^2cd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3\sqrt{1-c^2x^2}} - \frac{b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^3} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} - \frac{cd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg^3\sqrt{1-c^2x^2}} - \frac{d(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bcg^4(f+gx)\sqrt{1-c^2x^2}} - \frac{d(cf-g)(cf+g)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bcg^2(f+gx)} + \frac{a^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{2iabd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{2iabd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} + \frac{ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{2abd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}} - \frac{2b^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$2abd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{\ldots}\right)$$

```
[Out] -a^2*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/g^3-2*a*b*d*(c^2*f^2-g^2)^(3/2)
*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*
d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-2*b^2*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*
x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^
2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+2*a*b*d*(c^2*f^2-g^2)^(3/2)*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)
^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+2*b^2*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+
d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-2*I*b^2*d*(c^2*f^2-g^2)^(3/2)*polylog(3,I*(
I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)
/g^4/(-c^2*x^2+1)^(1/2)-2/27*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/g+1/3*
d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g-2*a*b*d*(c*f-g)*(
c*f+g)*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^3+2*b^2*d*(c*f-g)*(c*f+g)*(-c^2*d
*x^2+d)^(1/2)/g^3+2/9*b*c^3*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g/
(-c^2*x^2+1)^(1/2)+1/6*c*d*f*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^2
/(-c^2*x^2+1)^(1/2)+1/4*b^2*c*d*f*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^
2*x^2+1)^(1/2)-2/3*b*c*d*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x
^2+1)^(1/2)+2*I*a*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x
^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^
2+1)^(1/2)-1/4*b^2*c^2*d*f*x*(-c^2*d*x^2+d)^(1/2)/g^2+1/2*c^2*d*f*x*(a+b*ar
csin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g^2+2*I*b^2*d*(c^2*f^2-g^2)^(3/2)*polylog
(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)
^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+a^2*d*(c^2*f^2-g^2)^(3/2)*arctan((c^2*f*x+g)/
(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+
1)^(1/2)-b^2*d*(c*f-g)*(c*f+g)*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^3+I*b^2
*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-4/9*b^
2*d*(-c^2*d*x^2+d)^(1/2)/g-1/2*b*c^3*d*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-1/3*d*(c^2*f^2-g^2)^2*(a+b*arcsin(c*x))^3*(
-c^2*d*x^2+d)^(1/2)/b/c/g^4/(g*x+f)/(-c^2*x^2+1)^(1/2)-I*b^2*d*(c^2*f^2-g^2
)^(3/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2
)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+2*a*b*c*d*(c*f-g)*(c*
f+g)*x*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)+2*b^2*c*d*(c*f-g)*(c*f+g
)*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/3*c*d*(c*f-g)
*(c*f+g)*x*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^3/(-c^2*x^2+1)^(1/2
)-1/3*d*(c*f-g)*(c*f+g)*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+
d)^(1/2)/b/c/g^2/(g*x+f)-2*I*a*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*ln(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)
/g^4/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 2.55 (sec) , antiderivative size = 1992, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.970$, Rules used = {4861, 4851, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4849, 697, 4841, 4883,

1668, 12, 739, 210, 4881, 8, 4857, 3404, 2296, 2221, 2317, 2438, 4715, 267, 2611, 2320, 6724}

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{9g\sqrt{1-c^2x^2}}$$

$$-\frac{bdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{2g^2\sqrt{1-c^2x^2}}+\frac{dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^2}{2g^2}$$

$$-\frac{b^2dfx\sqrt{d-c^2dx^2}c^2}{4g^2}-\frac{d(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3c}{3bg^3\sqrt{1-c^2x^2}}$$

$$+\frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3c}{6bg^2\sqrt{1-c^2x^2}}+\frac{2b^2d(cf-g)(cf+g)x\sqrt{d-c^2dx^2}\arcsin(cx)c}{g^3\sqrt{1-c^2x^2}}$$

$$+\frac{b^2df\sqrt{d-c^2dx^2}\arcsin(cx)c}{4g^2\sqrt{1-c^2x^2}}-\frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c}{3g\sqrt{1-c^2x^2}}$$

$$+\frac{2abd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}c}{g^3\sqrt{1-c^2x^2}}-\frac{b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^3}$$

$$+\frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g}-\frac{2abd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3}$$

$$+\frac{a^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$-\frac{ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$-\frac{2iabd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$+\frac{ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$+\frac{2iabd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$-\frac{2b^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$-\frac{2abd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$+\frac{2b^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$+\frac{2abd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$-\frac{2ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

$$+\frac{2ib^2d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

```
[Out] (-4*b^2*d*Sqrt[d - c^2*d*x^2])/(9*g) - (a^2*d*(c*f - g)*(c*f + g)*Sqrt[d -
c^2*d*x^2])/g^3 + (2*b^2*d*(c*f - g)*(c*f + g)*Sqrt[d - c^2*d*x^2])/g^3 - (
b^2*c^2*d*f*x*Sqrt[d - c^2*d*x^2])/(4*g^2) + (2*a*b*c*d*(c*f - g)*(c*f + g)
*x*Sqrt[d - c^2*d*x^2])/(g^3*Sqrt[1 - c^2*x^2]) - (2*b^2*d*(1 - c^2*x^2)*Sq
rt[d - c^2*d*x^2])/(27*g) - (2*a*b*d*(c*f - g)*(c*f + g)*Sqrt[d - c^2*d*x^2
]*ArcSin[c*x])/g^3 + (b^2*c*d*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*g^2*Sqr
t[1 - c^2*x^2]) + (2*b^2*c*d*(c*f - g)*(c*f + g)*x*Sqrt[d - c^2*d*x^2]*ArcS
in[c*x])/(g^3*Sqrt[1 - c^2*x^2]) - (b^2*d*(c*f - g)*(c*f + g)*Sqrt[d - c^2*
d*x^2]*ArcSin[c*x]^2)/g^3 - (2*b*c*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(3*g*Sqrt[1 - c^2*x^2]) - (b*c^3*d*f*x^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(2*g^2*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]))/(9*g*Sqrt[1 - c^2*x^2]) + (c^2*d*f*x*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/(2*g^2) + (d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/(3*g) + (c*d*f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
^3)/(6*b*g^2*Sqrt[1 - c^2*x^2]) - (c*d*(c*f - g)*(c*f + g)*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*g^3*Sqrt[1 - c^2*x^2]) - (d*(c^2*f^2 - g^
2)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)*Sqrt[1
 - c^2*x^2]) - (d*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^3)/(3*b*c*g^2*(f + g*x)) + (a^2*d*(c^2*f^2 - g^2)^(3/2
)*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^
2*x^2])])/(g^4*Sqrt[1 - c^2*x^2]) - ((2*I)*a*b*d*(c^2*f^2 - g^2)^(3/2)*Sqrt
[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2
*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) - (I*b^2*d*(c^2*f^2 - g^2)^(3/2)*Sqr
t[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[
c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + ((2*I)*a*b*d*(c^2*f^2 - g^2)^(3
/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + (I*b^2*d*(c^2*f^2 - g^2)^(
3/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) - (2*a*b*d*(c^2*f^2 - g^2
)^(3/2)*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[
c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) - (2*b^2*d*(c^2*f^2 - g^2)^(3/2)*
Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - S
qrt[c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + (2*a*b*d*(c^2*f^2 - g^2)^(3
/2)*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*
f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + (2*b^2*d*(c^2*f^2 - g^2)^(3/2)*Sqrt
[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[
c^2*f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) - ((2*I)*b^2*d*(c^2*f^2 - g^2)^(3
/2)*Sqrt[d - c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*
f^2 - g^2])])/(g^4*Sqrt[1 - c^2*x^2]) + ((2*I)*b^2*d*(c^2*f^2 - g^2)^(3/2)*
Sqrt[d - c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])])/(g^4*Sqrt[1 - c^2*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\int\left(\frac{c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^2}-\frac{c^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g}+\frac{(-c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^2(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{f+gx}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^2df\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g^2\sqrt{1-c^2x^2}} - \frac{\left(c^2d\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g\sqrt{1-c^2x^2}}$$

$$= \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^3}{(f+gx)^2}\,dx}{3bc\sqrt{1-c^2x^2}} + \frac{\left(c^2df\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2g^2\sqrt{1-c^2x^2}} - \frac{\left(bc^3df\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{g^2\sqrt{1-c^2x^2}} - \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)(a+b\arcsin(cx))\,dx}{3g\sqrt{1-c^2x^2}}$$

$$= -\frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2}$$
$$+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}}$$
$$+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$
$$- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$+ \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(b^2c^4df\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2g^2\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3g\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} \\
&- \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&+ \frac{\left(d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\left(-\frac{a^2(c^2f^2-g^2+c^2fgx+c^2g^2x^2)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{2ab(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{g^2(f+gx)\sqrt{1-c^2x^2}} - \frac{b^2(c^2\ldots}{\ldots}\right.}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2df\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4g^2\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3g\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2}+\frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} \\
&- \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}}-\frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}}+\frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g}+\frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&- \frac{\left(a^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{c^2f^2-g^2+c^2fgx+c^2g^2x^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&- \frac{\left(2abd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{(c^2f^2-g^2+c^2fgx+c^2g^2x^2)\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{3g\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} - \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} + \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} - \frac{\left(a^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{c^2g^2(c^2f^2-g^2)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{c^2g^4\sqrt{1-c^2x^2}} - \frac{\left(2abd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\left(\frac{c^2gx\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{(c^2f^2-g^2)\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}} - \frac{\left(b^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\left(\frac{c^2gx\arcsin(cx)^2}{\sqrt{1-c^2x^2}}+\frac{(c^2f^2-g^2)\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\right)dx}{g^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} \\
&\quad - \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} + \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} \\
&\quad + \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&\quad - \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&\quad - \frac{\left(2abc^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2c^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{x\arcsin(cx)^2}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(a^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{1}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2abd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\int\frac{\arcsin(cx)^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2}$$
$$- \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} - \frac{2abd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3}$$
$$+ \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} - \frac{b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^3}$$
$$- \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2}$$
$$+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}}$$
$$+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}}$$
$$- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)}$$
$$- \frac{\left(2abcd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int 1\,dx}{g\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2b^2cd\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int \arcsin(cx)\,dx}{g\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(a^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{1}{-c^2f^2+g^2-x^2}\,dx, x, \frac{g+c^2fx}{\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2abd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{x}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{x^2}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} \\
&- \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} - \frac{2abcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} \\
&- \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} - \frac{2abd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} \\
&+ \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} - \frac{2b^2cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} \\
&- \frac{b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^3} \\
&- \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&+ \frac{a^2d(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(2b^2c^2d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{g\sqrt{1-c^2x^2}} \\
&- \frac{\left(4abd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{4b^2d\sqrt{d-c^2dx^2}}{9g} - \frac{a^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} \\
&+ \frac{2b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3} - \frac{b^2c^2dfx\sqrt{d-c^2dx^2}}{4g^2} \\
&- \frac{2abcd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} - \frac{2b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g} \\
&- \frac{2abd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3} \\
&+ \frac{b^2cdf\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^2\sqrt{1-c^2x^2}} - \frac{2b^2cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} \\
&- \frac{b^2d(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^3} \\
&- \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g\sqrt{1-c^2x^2}} - \frac{bc^3dfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g\sqrt{1-c^2x^2}} + \frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^2} \\
&+ \frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g} + \frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^2\sqrt{1-c^2x^2}} \\
&+ \frac{cd\left(1-\frac{c^2f^2}{g^2}\right)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&- \frac{d\left(1-\frac{c^2f^2}{g^2}\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&+ \frac{a^2d(cf-g)^2(cf+g)^2\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(4iabd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(4iabd\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&+ \frac{\left(2ib^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&- \frac{\left(2ib^2d\left(1-\frac{c^2f^2}{g^2}\right)(cf-g)(cf+g)\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}x^2}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{g\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}
$$

= Too large to display

Mathematica [A] (verified)

Time = 1.73 (sec) , antiderivative size = 740, normalized size of antiderivative = 0.37

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(54c^2fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+36g(1-c^2x\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(54*c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
+ 36*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2 + (18*c*f*(a + b*ArcSin[c*
x])^3)/b + (36*(c^2*f^2 - g^2)*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(b*c*(
f + g*x)) - 27*b*c*f*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x
^2)*ArcSin[c*x]) - 8*b*g*(b*Sqrt[1 - c^2*x^2]*(7 - c^2*x^2) + 9*c*x*(a + b*
ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])) - (36*(c^2*f^2 - g^2)*((c^2*f
^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*x])^3 +
 3*b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*x
+ b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]*((a + b*
ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2
])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (
I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E
^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*PolyLog[3, (I*E^(I
*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(b*c*g^2*(f + g*x))))/(10
8*g^2*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(-c^2d\,x^2+d)^{\frac{3}{2}}(a+b\arcsin(cx))^2}{gx+f}dx$$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{gx+f}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="fr
icas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}(cx))^2}{f+gx}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="ma
xima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{f+g\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

3.66 $\int (f+gx)^3 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 2290

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{96b^2d^2f^2g\sqrt{d-c^2dx^2}}{245c^2}$$
$$+\frac{160b^2d^2g^3\sqrt{d-c^2dx^2}}{3969c^4}-\frac{245b^2d^2f^3x\sqrt{d-c^2dx^2}}{1152}-\frac{359b^2d^2fg^2x\sqrt{d-c^2dx^2}}{12288c^2}$$
$$-\frac{1079b^2d^2fg^2x^3\sqrt{d-c^2dx^2}}{18432}+\frac{209b^2c^2d^2fg^2x^5\sqrt{d-c^2dx^2}}{4608}$$
$$-\frac{3}{256}b^2c^4d^2fg^2x^7\sqrt{d-c^2dx^2}+\frac{4abd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{16b^2d^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{245c^2}$$
$$+\frac{80b^2d^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4}-\frac{65b^2d^2f^3x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}$$
$$+\frac{36b^2d^2f^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}+\frac{4b^2d^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4}$$
$$-\frac{1}{108}b^2d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}+\frac{6b^2d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}$$
$$+\frac{50b^2d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{27783c^4}-\frac{2b^2d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}}{729c^4}$$
$$+\frac{115b^2d^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}+\frac{359b^2d^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12288c^3\sqrt{1-c^2x^2}}$$
$$+\frac{4b^2d^2g^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{63c^3\sqrt{1-c^2x^2}}+\frac{6bd^2f^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}}$$
$$-\frac{5bcd^2f^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}+\frac{15bd^2fg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}}$$
$$-\frac{6bcd^2f^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}}+\frac{2bd^2g^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}}$$
$$-\frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128\sqrt{1-c^2x^2}}+\frac{18bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}}$$
$$-\frac{2bcd^2g^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}}+\frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}$$
$$-\frac{6bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}+\frac{38bc^3d^2g^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}}$$
$$-\frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}}-\frac{2bc^5d^2g^3x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}}$$
$$+\frac{5bd^2f^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c}$$
$$+\frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}-\frac{2d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4}$$
$$+\frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2}-\frac{d^2g^3x^2\sqrt{d-c^2dx^2}(a+}{63c^2}$$

[Out] 160/3969*b^2*d^2*g^3*(-c^2*d*x^2+d)^(1/2)/c^4-245/1152*b^2*d^2*f^3*x*(-c^2*d*x^2+d)^(1/2)-2/63*d^2*g^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4+5/16*d^2*f^3*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/21*d^2*g^3*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-5/16*b*c*d^2*f^3*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/189*b*d^2*g^3*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/21*b*c*d^2*g^3*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+38/441*b*c^3*d^2*g^3*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/81*b*c^5*d^2*g^3*x^9*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/128*d^2*f*g^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)+1/18*b*d^2*f^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c-15/128*d^2*f*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+5/16*d^2*f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+3/8*d^2*f*g^2*x^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-3/7*d^2*f^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+115/1152*b^2*d^2*f^3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+5/48*d^2*f^3*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)-359/12288*b^2*d^2*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+209/4608*b^2*c^2*d^2*f*g^2*x^5*(-c^2*d*x^2+d)^(1/2)-3/256*b^2*c^4*d^2*f*g^2*x^7*(-c^2*d*x^2+d)^(1/2)+16/245*b^2*d^2*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+1/9*d^2*g^3*x^4*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+96/245*b^2*d^2*f^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-1079/18432*b^2*d^2*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+80/11907*b^2*d^2*g^3*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4-65/1728*b^2*d^2*f^3*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+4/1323*b^2*d^2*g^3*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-1/108*b^2*d^2*f^3*x*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)+50/27783*b^2*d^2*g^3*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^4-2/729*b^2*d^2*g^3*(-c^2*x^2+1)^4*(-c^2*d*x^2+d)^(1/2)/c^4-1/63*d^2*g^3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+15/64*d^2*f*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/63*d^2*g^3*x^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f^3*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-59/128*b*c*d^2*f*g^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+18/35*b*c^3*d^2*f^2*g*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/48*b*c^3*d^2*f*g^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-6/49*b*c^5*d^2*f^2*g*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3/32*b*c^5*d^2*f*g^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+6/7*b*d^2*f^2*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+15/128*b*d^2*f*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-6/7*b*c*d^2*f^2*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/63*a*b*d^2*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+359/12288*b^2*d^2*f*g^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/63*b^2*d^2*g^3*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+36/1225*b^2*d^2*f^2*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+6/343*b^2*d^2*f^2*g*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^2*f^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*

```
d*x^2+d)^(1/2)/c
```

Rubi [A] (verified)

Time = 2.17 (sec) , antiderivative size = 2290, normalized size of antiderivative = 1.00, number of steps used = 77, number of rules used = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.970$, Rules used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1813, 1864,

4787, 4783, 4795, 14, 4777, 470, 272, 45, 1281, 4715, 267, 457, 78, 276, 1265, 911, 1167}

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = -\frac{2bc^5d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^9}{81\sqrt{1-c^2x^2}}$$
$$-\frac{3bc^5d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^8}{32\sqrt{1-c^2x^2}}+\frac{38bc^3d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^7}{441\sqrt{1-c^2x^2}}$$
$$-\frac{6bc^5d^2f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^7}{49\sqrt{1-c^2x^2}}-\frac{3}{256}b^2c^4d^2fg^2\sqrt{d-c^2dx^2}x^7$$
$$+\frac{17bc^3d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^6}{48\sqrt{1-c^2x^2}}-\frac{2bcd^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{21\sqrt{1-c^2x^2}}$$
$$+\frac{18bc^3d^2f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{35\sqrt{1-c^2x^2}}+\frac{209b^2c^2d^2fg^2\sqrt{d-c^2dx^2}x^5}{4608}$$
$$+\frac{1}{21}d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4+\frac{1}{9}d^2g^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4$$
$$+\frac{5}{63}d^2g^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^4$$
$$-\frac{59bcd^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^4}{128\sqrt{1-c^2x^2}}+\frac{15}{64}d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3$$
$$+\frac{3}{8}d^2fg^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3$$
$$+\frac{5}{16}d^2fg^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3+\frac{2bd^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{189c\sqrt{1-c^2x^2}}$$
$$-\frac{6bcd^2f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{7\sqrt{1-c^2x^2}}-\frac{1079b^2d^2fg^2\sqrt{d-c^2dx^2}x^3}{18432}$$
$$-\frac{d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^2}{63c^2}-\frac{5bcd^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{16\sqrt{1-c^2x^2}}$$
$$+\frac{15bd^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{128c\sqrt{1-c^2x^2}}+\frac{5}{16}d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x$$
$$-\frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x}{128c^2}+\frac{1}{6}d^2f^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x$$
$$+\frac{5}{24}d^2f^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x+\frac{4b^2d^2g^3\sqrt{d-c^2dx^2}\arcsin(cx)x}{63c^3\sqrt{1-c^2x^2}}$$
$$+\frac{6bd^2f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{7c\sqrt{1-c^2x^2}}-\frac{245b^2d^2f^3\sqrt{d-c^2dx^2}x}{1152}$$
$$-\frac{359b^2d^2fg^2\sqrt{d-c^2dx^2}x}{12288c^2}-\frac{1}{108}b^2d^2f^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}x$$
$$-\frac{65b^2d^2f^3(1-c^2x^2)\sqrt{d-c^2dx^2}x}{1728}+\frac{4abd^2g^3\sqrt{d-c^2dx^2}x}{63c^3\sqrt{1-c^2x^2}}$$
$$+\frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}}+\frac{5d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{128bc^3\sqrt{1-c^2x^2}}$$
$$-\frac{2d^2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4}-\frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2}$$
$$+\frac{115b^2d^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}+\frac{359b^2d^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12288c^3\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}$$

```
[In] Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]

[Out] (96*b^2*d^2*f^2*g*Sqrt[d - c^2*d*x^2])/(245*c^2) + (160*b^2*d^2*g^3*Sqrt[d
 - c^2*d*x^2])/(3969*c^4) - (245*b^2*d^2*f^3*x*Sqrt[d - c^2*d*x^2])/1152 - (
359*b^2*d^2*f*g^2*x*Sqrt[d - c^2*d*x^2])/(12288*c^2) - (1079*b^2*d^2*f*g^2*
x^3*Sqrt[d - c^2*d*x^2])/18432 + (209*b^2*c^2*d^2*f*g^2*x^5*Sqrt[d - c^2*d*
x^2])/4608 - (3*b^2*c^4*d^2*f*g^2*x^7*Sqrt[d - c^2*d*x^2])/256 + (4*a*b*d^2
*g^3*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (16*b^2*d^2*f^2*g*
(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(245*c^2) + (80*b^2*d^2*g^3*(1 - c^2*x^2
)*Sqrt[d - c^2*d*x^2])/(11907*c^4) - (65*b^2*d^2*f^3*x*(1 - c^2*x^2)*Sqrt[d
 - c^2*d*x^2])/1728 + (36*b^2*d^2*f^2*g*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]
)/(1225*c^2) + (4*b^2*d^2*g^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1323*c^
4) - (b^2*d^2*f^3*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/108 + (6*b^2*d^2*f
^2*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^2) + (50*b^2*d^2*g^3*(1 -
c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(27783*c^4) - (2*b^2*d^2*g^3*(1 - c^2*x^2)^
4*Sqrt[d - c^2*d*x^2])/(729*c^4) + (115*b^2*d^2*f^3*Sqrt[d - c^2*d*x^2]*Arc
Sin[c*x])/(1152*c*Sqrt[1 - c^2*x^2]) + (359*b^2*d^2*f*g^2*Sqrt[d - c^2*d*x^
2]*ArcSin[c*x])/(12288*c^3*Sqrt[1 - c^2*x^2]) + (4*b^2*d^2*g^3*x*Sqrt[d - c
^2*d*x^2]*ArcSin[c*x])/(63*c^3*Sqrt[1 - c^2*x^2]) + (6*b*d^2*f^2*g*x*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c*Sqrt[1 - c^2*x^2]) - (5*b*c*d^2*f^3
*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*Sqrt[1 - c^2*x^2]) + (15*
b*d^2*f*g^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^
2*x^2]) - (6*b*c*d^2*f^2*g*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*
Sqrt[1 - c^2*x^2]) + (2*b*d^2*g^3*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(189*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*f*g^2*x^4*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x]))/(128*Sqrt[1 - c^2*x^2]) + (18*b*c^3*d^2*f^2*g*x^5*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*g^3
*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(21*Sqrt[1 - c^2*x^2]) + (17*
b*c^3*d^2*f*g^2*x^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c
^2*x^2]) - (6*b*c^5*d^2*f^2*g*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(49*Sqrt[1 - c^2*x^2]) + (38*b*c^3*d^2*g^3*x^7*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x]))/(441*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*f*g^2*x^8*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*g^3*x^9*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(81*Sqrt[1 - c^2*x^2]) + (5*b*d^2*f
^3*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (b
*d^2*f^3*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*c
) - (2*d^2*g^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^4) + (5*d^2
*f^3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 - (15*d^2*f*g^2*x*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) - (d^2*g^3*x^2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^2) + (15*d^2*f*g^2*x^3*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^2)/64 + (d^2*g^3*x^4*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^2)/21 + (5*d^2*f^3*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^2)/24 + (5*d^2*f*g^2*x^3*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x])^2)/16 + (5*d^2*g^3*x^4*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/63 + (d^2*f^3*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2]*(a
```

```
 + b*ArcSin[c*x])^2)/6 + (3*d^2*f*g^2*x^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/8 + (d^2*g^3*x^4*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/9 - (3*d^2*f^2*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^2)/(7*c^2) + (5*d^2*f^3*Sqrt[d - c^2*d*x^2]*(a + b
*ArcSin[c*x])^3)/(48*b*c*Sqrt[1 - c^2*x^2]) + (5*d^2*f*g^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^3)/(128*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2+3f^2gx(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2+\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2f^3\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3d^2f^2g\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(d^2g^3\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{6}d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{3}{8}d^2fg^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{9}d^2g^3x^4\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{\left(5d^2f^3\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{6\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2f^3\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^2(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(6bd^2f^2g\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^3(a+b\arcsin(cx))\,dx}{7c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(3bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^2(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5d^2g^3\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{9\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2bcd^2g^3\sqrt{d-c^2dx^2}\right)\int x^4(1-c^2x^2)^2(a+b\arcsin(cx))\,dx}{9\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{6bd^2f^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{6bcd^2f^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bcd^2fg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} \\
&\quad + \frac{18bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcd^2g^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4\sqrt{1-c^2x^2}} \\
&\quad - \frac{6bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bc^3d^2g^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{63\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^5d^2g^3x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad + \frac{5}{24}d^2f^3x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{16}d^2fg^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{63}d^2g^3x^4(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}d^2f^3x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{3}{8}d^2fg^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{9}d^2g^3x^4(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{\left(5d^2f^3\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d^2f^3\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^{5/2}\,dx}{18\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2f^3\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)(a+b\arcsin(cx))\,dx}{12\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(6b^2d^2f^2g\sqrt{d-c^2dx^2}\right)\int\frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(15d^2fg^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2fg^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)(a+b\arcsin(cx))\,dx}{\cdots}
\end{aligned}
$$

= Too large to display

Mathematica [A] (verified)

Time = 1.28 (sec) , antiderivative size = 1114, normalized size of antiderivative = 0.49

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \frac{d^2\sqrt{d-c^2dx^2}\left(333396000a^3(8c^3f^3+3cfg^2)+3175200a^2b\sqrt{1-c^2x^2}(-256g^3-c^2g(3456\right.}{}$$

```
[In] Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(333396000*a^3*(8*c^3*f^3 + 3*c*f*g^2) + 3175200*a
^2*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*x^
2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6
*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924
*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) - 10080*a*b^2*c*x*(-16
1280*g^3 - 105*c^2*g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) + 945*c^4*x*(18
48*f^3 + 2304*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) - 72*c^6*x^3*(9555*f^
3 + 18144*f^2*g*x + 12495*f*g^2*x^2 + 3040*g^3*x^3) + 20*c^8*x^5*(7056*f^3
+ 15552*f^2*g*x + 11907*f*g^2*x^2 + 3136*g^3*x^3)) - b^3*Sqrt[1 - c^2*x^2]*
(-1257472000*g^3 + c^2*g*(-12905422848*f^2 + 748057275*f*g*x + 184115200*g^
2*x^2) + 400*c^8*x^5*(592704*f^3 + 1119744*f^2*g*x + 750141*f*g^2*x^2 + 175
616*g^3*x^3) - 8*c^6*x^3*(179663400*f^3 + 262020096*f^2*g*x + 145166175*f*g
^2*x^2 + 29363200*g^3*x^3) + 6*c^4*x*(1107615600*f^3 + 753463296*f^2*g*x +
249815475*f*g^2*x^2 + 34304000*g^3*x^3)) + 315*b*(3175200*a^2*(8*c^3*f^3 +
3*c*f*g^2) + 20160*a*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*
f*g*x + 128*g^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 5
6*g^3*x^3) - 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x
^3) + 6*c^4*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) + b^
2*c*(315*g^2*(7539*f + 16384*g*x) - 30240*c^4*x^2*(1848*f^3 + 2304*f^2*g*x
+ 1239*f*g^2*x^2 + 256*g^3*x^3) + 3360*c^2*(6279*f^3 + 20736*f^2*g*x + 2835
*f*g^2*x^2 + 256*g^3*x^3) + 2304*c^6*x^4*(9555*f^3 + 18144*f^2*g*x + 12495*
f*g^2*x^2 + 3040*g^3*x^3) - 640*c^8*x^6*(7056*f^3 + 15552*f^2*g*x + 11907*f
*g^2*x^2 + 3136*g^3*x^3)))*ArcSin[c*x] + 3175200*b^2*(315*a*(8*c^3*f^3 + 3*
c*f*g^2) + b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 12
8*g^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3)
 - 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^
4*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)))*ArcSin[c*x]^2
 + 333396000*b^3*c*f*(8*c^2*f^2 + 3*g^2)*ArcSin[c*x]^3))/(25604812800*b*c^4
*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.22 (sec) , antiderivative size = 5977, normalized size of antiderivative = 2.61

method	result	size
default	Expression too large to display	5977
parts	Expression too large to display	5977

```
[In] int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERB
OSE)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
fricas")
```

```
[Out] integral((a^2*c^4*d^2*g^3*x^7 + 3*a^2*c^4*d^2*f*g^2*x^6 + 3*a^2*d^2*f^2*g*x
 + a^2*d^2*f^3 + (3*a^2*c^4*d^2*f^2*g - 2*a^2*c^2*d^2*g^3)*x^5 + (a^2*c^4*d
^2*f^3 - 6*a^2*c^2*d^2*f*g^2)*x^4 - (6*a^2*c^2*d^2*f^2*g - a^2*d^2*g^3)*x^3
 - (2*a^2*c^2*d^2*f^3 - 3*a^2*d^2*f*g^2)*x^2 + (b^2*c^4*d^2*g^3*x^7 + 3*b^2
*c^4*d^2*f*g^2*x^6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*f^2*g
 - 2*b^2*c^2*d^2*g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x^4 - (
6*b^2*c^2*d^2*f^2*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*d^2*f*g
^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^3*x^7 + 3*a*b*c^4*d^2*f*g^2*x^6 +
 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2*f^2*g - 2*a*b*c^2*d^2*g^3
)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*x^4 - (6*a*b*c^2*d^2*f^2*g
- a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b*d^2*f*g^2)*x^2)*arcsin(c*x)
)*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^3 (b\arcsin(cx)+a)^2 \, dx$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
maxima")
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^3 + 1/128*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*x
^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*arcs
in(c*x)/c^3)*a^2*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(7/2)/(c^4*d))*a^2*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a^2*f^2*g
/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g^3*x^7 + 3*b^2*c^4*d^2*f*g^2*x^
6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*f^2*g - 2*b^2*c^2*d^2*
g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x^4 - (6*b^2*c^2*d^2*f^2
*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*d^2*f*g^2)*x^2)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^3*x^7 + 3*a*b*c^4*d
^2*f*g^2*x^6 + 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2*f^2*g - 2*a
*b*c^2*d^2*g^3)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*x^4 - (6*a*b*
c^2*d^2*f^2*g - a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b*d^2*f*g^2)*x^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)
, x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.67 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1533

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\, dx = \frac{64b^2d^2fg\sqrt{d-c^2dx^2}}{245c^2} - \frac{245b^2d^2f^2x\sqrt{d-c^2dx^2}}{1152} - \frac{359b^2d^2g^2x\sqrt{d-c^2dx^2}}{36864c^2} - \frac{1079b^2d^2g^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2g^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{256}b^2c^4d^2g^2x^7\sqrt{d-c^2dx^2} + \frac{32b^2d^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} - \frac{65b^2d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} + \frac{24b^2d^2fg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} - \frac{1}{108}b^2d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} + \frac{4b^2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2} + \frac{115b^2d^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}} + \frac{359b^2d^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{36864c^3\sqrt{1-c^2x^2}} + \frac{4bd^2fgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{5bcd^2f^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} + \frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}} - \frac{4bcd^2fgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} + \frac{12bc^3d^2fgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} + \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{4bc^5d^2fgx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} + \frac{5bd^2f^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b$$

```
[Out] -245/1152*b^2*d^2*f^2*x*(-c^2*d*x^2+d)^(1/2)-1079/55296*b^2*d^2*g^2*x^3*(-c
^2*d*x^2+d)^(1/2)+5/16*d^2*f^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5
/64*d^2*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/384*d^2*g^2*(a+b
*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)+64/245*b^2*d^
2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-359/36864*b^2*d^2*g^2*x*(-c^2*d*x^2+d)^(1/2)
/c^2+209/13824*b^2*c^2*d^2*g^2*x^5*(-c^2*d*x^2+d)^(1/2)-59/384*b*c*d^2*g^2*
x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/144*b*c^3*
d^2*g^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/32*
b*c^5*d^2*g^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

```
+1/18*b*d^2*f^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
-2/7*d^2*f*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+11
5/1152*b^2*d^2*f^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+35
9/36864*b^2*d^2*g^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)
+5/48*d^2*f^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/
2)+24/1225*b^2*d^2*f*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+4/343*b^2*d^
2*f*g*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^2*f^2*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+4/7*b*d^2*f*g*x*(a+b*arcsin(c
*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/7*b*c*d^2*f*g*x^3*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+12/35*b*c^3*d^2*f*g*x^5*(
a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-4/49*b*c^5*d^2*f*g
*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/256*b^2*c^
4*d^2*g^2*x^7*(-c^2*d*x^2+d)^(1/2)-65/1728*b^2*d^2*f^2*x*(-c^2*x^2+1)*(-c^2
*d*x^2+d)^(1/2)-1/108*b^2*d^2*f^2*x*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)-5/1
28*d^2*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+5/24*d^2*f^2*x*(-
c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/48*d^2*g^2*x^3*(-c^2*
x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f^2*x*(-c^2*x^2+1)^
2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/8*d^2*g^2*x^3*(-c^2*x^2+1)^2*(
a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-5/16*b*c*d^2*f^2*x^2*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/128*b*d^2*g^2*x^2*(a+b*arcsin
(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+32/735*b^2*d^2*f*g*(-c^2*x
^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 1533, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.727$, Rules used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1813, 1864,

4787, 4783, 4795, 14, 4777, 470, 272, 45, 1281}

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx =$$

$$-\frac{bc^5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^8}{32\sqrt{1-c^2x^2}}$$
$$-\frac{4bc^5d^2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^7}{49\sqrt{1-c^2x^2}}$$
$$-\frac{1}{256}b^2c^4d^2g^2\sqrt{d-c^2dx^2}x^7$$
$$+\frac{17bc^3d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^6}{144\sqrt{1-c^2x^2}}$$
$$+\frac{12bc^3d^2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{35\sqrt{1-c^2x^2}}$$
$$+\frac{209b^2c^2d^2g^2\sqrt{d-c^2dx^2}x^5}{13824}$$
$$-\frac{59bcd^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^4}{384\sqrt{1-c^2x^2}}$$
$$+\frac{5}{64}d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3$$
$$+\frac{1}{8}d^2g^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3$$
$$+\frac{5}{48}d^2g^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x^3$$
$$-\frac{4bcd^2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{7\sqrt{1-c^2x^2}}$$
$$-\frac{1079b^2d^2g^2\sqrt{d-c^2dx^2}x^3}{55296}$$
$$-\frac{5bcd^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{16\sqrt{1-c^2x^2}}$$
$$+\frac{5bd^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{128c\sqrt{1-c^2x^2}}$$
$$+\frac{5}{16}d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x$$
$$-\frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x}{128c^2}$$
$$+\frac{1}{6}d^2f^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x$$
$$+\frac{5}{24}d^2f^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x$$
$$+\frac{4bd^2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{7c\sqrt{1-c^2x^2}}-\frac{245b^2d^2f^2\sqrt{d-c^2dx^2}x}{1152}$$
$$-\frac{359b^2d^2g^2\sqrt{d-c^2dx^2}x}{36864c^2}-\frac{1}{108}b^2d^2f^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}x$$
$$-\frac{65b^2d^2f^2(1-c^2x^2)\sqrt{d-c^2dx^2}x}{1728}$$
$$+\frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}}$$

```
[In] Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (64*b^2*d^2*f*g*Sqrt[d - c^2*d*x^2])/(245*c^2) - (245*b^2*d^2*f^2*x*Sqrt[d
- c^2*d*x^2])/1152 - (359*b^2*d^2*g^2*x*Sqrt[d - c^2*d*x^2])/(36864*c^2) -
(1079*b^2*d^2*g^2*x^3*Sqrt[d - c^2*d*x^2])/55296 + (209*b^2*c^2*d^2*g^2*x^5
*Sqrt[d - c^2*d*x^2])/13824 - (b^2*c^4*d^2*g^2*x^7*Sqrt[d - c^2*d*x^2])/256
 + (32*b^2*d^2*f*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(735*c^2) - (65*b^2*d
^2*f^2*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/1728 + (24*b^2*d^2*f*g*(1 - c^2
*x^2)^2*Sqrt[d - c^2*d*x^2])/(1225*c^2) - (b^2*d^2*f^2*x*(1 - c^2*x^2)^2*Sq
rt[d - c^2*d*x^2])/108 + (4*b^2*d^2*f*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2]
)/(343*c^2) + (115*b^2*d^2*f^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*Sqr
t[1 - c^2*x^2]) + (359*b^2*d^2*g^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(36864*
c^3*Sqrt[1 - c^2*x^2]) + (4*b*d^2*f*g*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]))/(7*c*Sqrt[1 - c^2*x^2]) - (5*b*c*d^2*f^2*x^2*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(16*Sqrt[1 - c^2*x^2]) + (5*b*d^2*g^2*x^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d^2*f*g*x^3*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*g
^2*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(384*Sqrt[1 - c^2*x^2]) + (
12*b*c^3*d^2*f*g*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt[1 -
c^2*x^2]) + (17*b*c^3*d^2*g^2*x^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(144*Sqrt[1 - c^2*x^2]) - (4*b*c^5*d^2*f*g*x^7*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*g^2*x^8*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) + (5*b*d^2*f^2*(1 - c^2*x^2)^
(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (b*d^2*f^2*(1 - c^2
*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*c) + (5*d^2*f^2*x*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 - (5*d^2*g^2*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) + (5*d^2*g^2*x^3*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/64 + (5*d^2*f^2*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/24 + (5*d^2*g^2*x^3*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/48 + (d^2*f^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/6 + (d^2*g^2*x^3*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/8 - (2*d^2*f*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/(7*c^2) + (5*d^2*f^2*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^3)/(48*b*c*Sqrt[1 - c^2*x^2]) + (5*d^2*g^2*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x])^3)/(384*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
```

```
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
```

```
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2+2fgx(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2+g^2\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2f^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2d^2fg\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(d^2g^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{6} d^2 f^2 x \left(1-c^2x^2\right)^2 \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{8} d^2 g^2 x^3 \left(1-c^2x^2\right)^2 \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2 fg(1-c^2x^2)^3 \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right) \int (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2 \, dx}{6\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2f^2\sqrt{d-c^2dx^2}\right) \int x(1-c^2x^2)^2 (a+b\arcsin(cx)) \, dx}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(4bd^2fg\sqrt{d-c^2dx^2}\right) \int (1-c^2x^2)^3 (a+b\arcsin(cx)) \, dx}{7c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right) \int x^2(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2 \, dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2g^2\sqrt{d-c^2dx^2}\right) \int x^3(1-c^2x^2)^2 (a+b\arcsin(cx)) \, dx}{4\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{4bd^2fgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{4bcd^2fgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd^2g^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} \\
&\quad + \frac{12bc^3d^2fgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2g^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{12\sqrt{1-c^2x^2}} \\
&\quad - \frac{4bc^5d^2fgx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} \\
&\quad + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad + \frac{5}{24}d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{48}d^2g^2x^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}d^2f^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{8}d^2g^2x^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d^2f^2\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^{5/2}\,dx}{18\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2f^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)(a+b\arcsin(cx))\,dx}{12\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(4b^2d^2fg\sqrt{d-c^2dx^2}\right)\int\frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5bcd^2g^2\sqrt{d-c^2dx^2}\right)\int x^3(1-c^2x^2)(a+b\arcsin(cx))\,dx}{24\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4(6-8c^2x^2+3c^4x^4)}{24\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{1}{108}b^2d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}+\frac{4bd^2fgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} \\
&\quad-\frac{4bcd^2fgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad-\frac{11bcd^2g^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{96\sqrt{1-c^2x^2}} \\
&\quad+\frac{12bc^3d^2fgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&\quad+\frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} \\
&\quad-\frac{4bc^5d^2fgx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad-\frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} \\
&\quad+\frac{5bd^2f^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&\quad+\frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad+\frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad-\frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad+\frac{\left(5d^2f^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(5b^2d^2f^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\,dx}{108\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(5b^2d^2f^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}\,dx}{48\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(5bcd^2f^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(4b^2d^2fg\sqrt{d-c^2dx^2}\right)\int\frac{x\left(35-35c^2x^2+21c^4x^4-5c^6x^6\right)}{\sqrt{1-c^2x^2}}\,dx}{245\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}}-\frac{\left(5bcd^2g^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{32\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(b^2c^2d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(6-8c^2x^2+3c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{96\sqrt{1-c^2x^2}}+\frac{\left(5b^2c^2d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx}{24\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{1}{256}b^2c^4d^2g^2x^7\sqrt{d-c^2dx^2} - \frac{65b^2d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} \\
&\quad - \frac{1}{108}b^2d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} + \frac{4bd^2fgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} \\
&\quad - \frac{5bcd^2f^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{4bcd^2fgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} \\
&\quad + \frac{12bc^3d^2fgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&\quad + \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} \\
&\quad - \frac{4bc^5d^2fgx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} \\
&\quad + \frac{5bd^2f^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&\quad + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} \\
&\quad + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}} - \frac{\left(5b^2d^2f^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{144\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5b^2d^2f^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{64\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2f^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2d^2fg\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{35-35c^2x+21c^4x^2-5c^6x^3}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{245\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(-48c^2+43c^4x^2\right)}{\sqrt{1-c^2x^2}}\,dx}{768\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$\left(5d^2g^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx \quad \left(5bd^2g^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx$$

= Too large to display

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 742, normalized size of antiderivative = 0.48

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(12348000a^3(8c^2f^2+g^2)-3360ab^2c^2x(1960c^2f^2x(99-39c^2x^2+8c^4x^4)}{}$$

```
[In] Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(12348000*a^3*(8*c^2*f^2 + g^2) - 3360*a*b^2*c^2*x
*(1960*c^2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 4608*f*g*(-35 + 35*c^2*x^2
 - 21*c^4*x^4 + 5*c^6*x^6) + 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4 + 3
6*c^6*x^6)) + 352800*a^2*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 +
56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 1
36*c^4*x^4 + 48*c^6*x^6)) - b^3*c*Sqrt[1 - c^2*x^2]*(274400*c^2*f^2*x*(897
- 194*c^2*x^2 + 32*c^4*x^4) + 147456*f*g*(-2161 + 757*c^2*x^2 - 351*c^4*x^4
 + 75*c^6*x^6) + 8575*g^2*x*(1077 + 2158*c^2*x^2 - 1672*c^4*x^4 + 432*c^6*x
^6)) + 105*b*(352800*a^2*(8*c^2*f^2 + g^2) + b^2*(87955*g^2 + 1120*c^2*(209
3*f^2 + 4608*f*g*x + 315*g^2*x^2) - 3360*c^4*x^2*(1848*f^2 + 1536*f*g*x + 4
13*g^2*x^2) - 640*c^8*x^6*(784*f^2 + 1152*f*g*x + 441*g^2*x^2) + 1792*c^6*x
^4*(1365*f^2 + 1728*f*g*x + 595*g^2*x^2)) + 6720*a*b*c*Sqrt[1 - c^2*x^2]*(7
68*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^
2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x] + 352800*b
^2*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)
^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x]^2 + 12348000*b^3*(8*c^2*f^2 + g
^2)*ArcSin[c*x]^3))/(948326400*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.06 (sec) , antiderivative size = 4170, normalized size of antiderivative = 2.72

method	result	size
default	Expression too large to display	4170
parts	Expression too large to display	4170

```
[In] int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*
d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1/6*
x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2
*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(
1/2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b^2*(-5/384*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(8*c^2*f^2+g^2)*d^2+
1/21952*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x
^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(14*I*arcsin(c*x
)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-3/274400*(-d*(c^2*x^2-1))^(1/2)*(
I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(630*I*arcsin(c*x)+1225*arcsin(c*x)
^2-106)*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/6912*(-d*(c^2*x^2-1))^(1/2
)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*
c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1
/2)-6*c*x)*(6*I*arcsin(c*x)*c^2*f^2+18*arcsin(c*x)^2*c^2*f^2-6*I*arcsin(c*x
)*g^2-18*arcsin(c*x)^2*g^2-c^2*f^2+g^2)*d^2/c^3/(c^2*x^2-1)+1/65536*(-d*(c^
2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*
x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x
^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*g
^2*(8*I*arcsin(c*x)+32*arcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)-5/64*(-d*(c^2*x
^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)^2-2+2*I*
arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1
)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c^2/(c^2*x
^2-1)+1/192*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^
4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-6*I*arcsin(c*x)+9*arcsin(c*
x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/55296*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(
-c^2*x^2+1)^(1/2)-I)*(696*I*arcsin(c*x)*c^2*f^2+1152*arcsin(c*x)^2*c^2*f^2-
156*I*arcsin(c*x)*g^2-72*arcsin(c*x)^2*g^2-154*c^2*f^2+19*g^2)*cos(5*arcsin
(c*x))*d^2/c^3/(c^2*x^2-1)-1/68600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(
1/2)*x*c+c^2*x^2-1)*f*g*(385*I*arcsin(c*x)+1225*arcsin(c*x)^2-92)*cos(6*arc
sin(c*x))*d^2/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(30*arcsin(c*x)^2*c^2
*f^2+2*arcsin(c*x)^2*g^2-15*c^2*f^2-30*I*arcsin(c*x)*c^2*f^2-g^2-2*I*arcsin
(c*x)*g^2)*d^2/c^3/(c^2*x^2-1)-3/2048*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x
*(-c^2*x^2+1)^(1/2)-I)*(88*I*arcsin(c*x)*c^2*f^2+64*arcsin(c*x)^2*c^2*f^2+4
*I*arcsin(c*x)*g^2+8*arcsin(c*x)^2*g^2-38*c^2*f^2-3*g^2)*cos(3*arcsin(c*x))
*d^2/c^3/(c^2*x^2-1)+5/55296*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x
*c+c^2*x^2-1)*(120*I*arcsin(c*x)*c^2*f^2+288*arcsin(c*x)^2*c^2*f^2-12*I*arc
sin(c*x)*g^2-72*arcsin(c*x)^2*g^2-34*c^2*f^2+7*g^2)*sin(5*arcsin(c*x))*d^2/
c^3/(c^2*x^2-1)-1/1200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*f*g*(30*I*arcsin(c*x)+75*arcsin(c*x)^2-14)*cos(4*arcsin(c*x))*d^2/c
^2/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1
/2)-I)*f*g*(90*I*arcsin(c*x)+75*arcsin(c*x)^2-22)*sin(4*arcsin(c*x))*d^2/c^
2/(c^2*x^2-1)+1/65536*(-d*(c^2*x^2-1))^(1/2)*(128*I*(-c^2*x^2+1)^(1/2)*x^8*
```

c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7+160*I*(-c^2*x^
2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3+I
*(-c^2*x^2+1)^(1/2)+8*c*x)*g^2*(-8*I*arcsin(c*x)+32*arcsin(c*x)^2-1)*d^2/c^
3/(c^2*x^2-1)+1/2048*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x
^2-1)*(216*I*arcsin(c*x)*c^2*f^2+288*arcsin(c*x)^2*c^2*f^2+20*I*arcsin(c*x)
*g^2+8*arcsin(c*x)^2*g^2-126*c^2*f^2-7*g^2)*sin(3*arcsin(c*x))*d^2/c^3/(c^2
*x^2-1))+2*a*b*(-5/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x
^2-1)*arcsin(c*x)^2*(8*c^2*f^2+g^2)*d^2+1/3136*(-d*(c^2*x^2-1))^(1/2)*(64*c
^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x
^2+1)^(1/2)*x*c+1)*f*g*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/2304*(-d*(c^
2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2
+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(
-c^2*x^2+1)^(1/2)-6*c*x)*(6*arcsin(c*x)*c^2*f^2+I*c^2*f^2-6*arcsin(c*x)*g^2
-I*g^2)*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-
c^2*x^2+1)^(1/2)-I)*(22*I*c^2*f^2+32*arcsin(c*x)*c^2*f^2+I*g^2+4*arcsin(c*x
)*g^2)*cos(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/2)*(
c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)
-5/64*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcs
in(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/64*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c
^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3
*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/160*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c
x(-c^2*x^2+1)^(1/2)-I)*f*g*(3*I+5*arcsin(c*x))*sin(4*arcsin(c*x))*d^2/c^2
/(c^2*x^2-1)+1/16384*(-d*(c^2*x^2-1))^(1/2)*(128*I*(-c^2*x^2+1)^(1/2)*x^8*c
^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7+160*I*(-c^2*x^2
+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3+I*
(-c^2*x^2+1)^(1/2)+8*c*x)*g^2*(-I+8*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-1/3920
(-d(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(11*I+70*a
rcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/9216*(-d*(c^2*x^2-1))^
(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(58*I*c^2*f^2+192*arcsin(c*x)*c^
2*f^2-13*I*g^2-12*arcsin(c*x)*g^2)*cos(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3
/7840*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(9*I+
35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+5/9216*(-d*(c^2*x^2-
1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(10*I*c^2*f^2+48*arcsin(c*x)
*c^2*f^2-I*g^2-12*arcsin(c*x)*g^2)*sin(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-1
/80*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(I+5*ar
csin(c*x))*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1
/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(
30*arcsin(c*x)*c^2*f^2+2*arcsin(c*x)*g^2-15*I*c^2*f^2-I*g^2)*d^2/c^3/(c^2*x
^2-1)+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128
*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(1
/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^2*
x^2+1)^(1/2)+8*c*x)*g^2*(8*arcsin(c*x)+I)*d^2/c^3/(c^2*x^2-1)+1/1024*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(54*I*c^2*f^2+144*arc
sin(c*x)*c^2*f^2+5*I*g^2+4*arcsin(c*x)*g^2)*sin(3*arcsin(c*x))*d^2/c^3/(c^2

```
*x^2-1))
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin{(cx)}+a)^2\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
fricas")
```

```
[Out] integral((a^2*c^4*d^2*g^2*x^6 + 2*a^2*c^4*d^2*f*g*x^5 - 4*a^2*c^2*d^2*f*g*x
^3 + 2*a^2*d^2*f*g*x + a^2*d^2*f^2 + (a^2*c^4*d^2*f^2 - 2*a^2*c^2*d^2*g^2)*
x^4 - (2*a^2*c^2*d^2*f^2 - a^2*d^2*g^2)*x^2 + (b^2*c^4*d^2*g^2*x^6 + 2*b^2*
c^4*d^2*f*g*x^5 - 4*b^2*c^2*d^2*f*g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2 + (
b^2*c^4*d^2*f^2 - 2*b^2*c^2*d^2*g^2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^2*g^2
)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5 - 4*a
*b*c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^2 - 2*a
*b*c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arcsin(c*x))*s
qrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin{(cx)}+a)^2\,dx$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
maxima")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^2 + 1/384*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*x
^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*arcs
in(c*x)/c^3)*a^2*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a^2*f*g/(c^2*d) + sqrt(d)
*integrate(((b^2*c^4*d^2*g^2*x^6 + 2*b^2*c^4*d^2*f*g*x^5 - 4*b^2*c^2*d^2*f*
g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2 + (b^2*c^4*d^2*f^2 - 2*b^2*c^2*d^2*g^
2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^2*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5 - 4*a*b*
c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^2 - 2*a*b*
c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="
giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.68 $\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 31, antiderivative size = 878

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \frac{32b^2d^2g\sqrt{d-c^2dx^2}}{245c^2} - \frac{245b^2d^2fx\sqrt{d-c^2dx^2}}{1152} + \frac{16b^2d^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} - \frac{65b^2d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} + \frac{12b^2d^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} - \frac{1}{108}b^2d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} + \frac{2b^2d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2} + \frac{115b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}} + \frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{5bcd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} - \frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} + \frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2 \sqrt{}$$

```
[Out] 32/245*b^2*d^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-245/1152*b^2*d^2*f*x*(-c^2*d*x^2+
d)^(1/2)+16/735*b^2*d^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2-65/1728*b^2
*d^2*f*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+12/1225*b^2*d^2*g*(-c^2*x^2+1)^2
*(-c^2*d*x^2+d)^(1/2)/c^2-1/108*b^2*d^2*f*x*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(
1/2)+2/343*b^2*d^2*g*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^2*f*(
-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+1/18*b*d^2*f*(-c
```

```
^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f*x*(a+b*
arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f*x*(-c^2*x^2+1)*(a+b*arcsin(c
*x))^2*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)-1/7*d^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x
^2+d)^(1/2)/c^2+115/1152*b^2*d^2*f*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2
*x^2+1)^(1/2)+2/7*b*d^2*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*
x^2+1)^(1/2)-5/16*b*c*d^2*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)-2/7*b*c*d^2*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*g*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*g*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+5/48*d^2*f*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)
/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 878, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.484$, Rules

used = {4861, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1813, 1864}

$$\begin{aligned}
&\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \\
&-\frac{2bc^5d^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^7}{49\sqrt{1-c^2x^2}} \\
&+\frac{6bc^3d^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^5}{35\sqrt{1-c^2x^2}} \\
&-\frac{2bcd^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^3}{7\sqrt{1-c^2x^2}} \\
&-\frac{5bcd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x^2}{16\sqrt{1-c^2x^2}} \\
&+\frac{1}{6}d^2f\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x \\
&+\frac{5}{16}d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x \\
&+\frac{5}{24}d^2f\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2x \\
&+\frac{2bd^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))x}{7c\sqrt{1-c^2x^2}} \\
&-\frac{1}{108}b^2d^2f\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}x-\frac{245b^2d^2f\sqrt{d-c^2dx^2}x}{1152} \\
&-\frac{65b^2d^2f(1-c^2x^2)\sqrt{d-c^2dx^2}x}{1728}+\frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}} \\
&-\frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&+\frac{115b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}} \\
&+\frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&+\frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&+\frac{2b^2d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}+\frac{12b^2d^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} \\
&+\frac{32b^2d^2g\sqrt{d-c^2dx^2}}{245c^2}+\frac{16b^2d^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}
\end{aligned}$$

```
[In] Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d^2*g*Sqrt[d - c^2*d*x^2])/(245*c^2) - (245*b^2*d^2*f*x*Sqrt[d - c^
2*d*x^2])/1152 + (16*b^2*d^2*g*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(735*c^2)
 - (65*b^2*d^2*f*x*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/1728 + (12*b^2*d^2*g*
(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1225*c^2) - (b^2*d^2*f*x*(1 - c^2*x^2
```

```
)^2*Sqrt[d - c^2*d*x^2])/108 + (2*b^2*d^2*g*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*
x^2])/(343*c^2) + (115*b^2*d^2*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*S
qrt[1 - c^2*x^2]) + (2*b*d^2*g*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(
7*c*Sqrt[1 - c^2*x^2]) - (5*b*c*d^2*f*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/(16*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*g*x^3*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/(7*Sqrt[1 - c^2*x^2]) + (6*b*c^3*d^2*g*x^5*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(35*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*g*x^7*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) + (5*b*d^2*f*(1 -
 c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (b*d^2*f*
(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*c) + (5*d^
2*f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5*d^2*f*x*(1 - c^2*x
^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/24 + (d^2*f*x*(1 - c^2*x^2)^
2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/6 - (d^2*g*(1 - c^2*x^2)^3*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(7*c^2) + (5*d^2*f*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^3)/(48*b*c*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
```

```
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \left(f(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2+gx(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(d^2f\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d^2g\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} + \frac{\left(5d^2f\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{6\sqrt{1-c^2x^2}} - \frac{\left(bcd^2f\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} + \frac{\left(2bd^2g\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^3(a+b\arcsin(cx))\,dx}{7c\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} + \frac{bd^2f\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} + \frac{\left(5d^2f\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2d^2f\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{5/2}\,dx}{18\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2f\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{12\sqrt{1-c^2x^2}} - \frac{\left(2b^2d^2g\sqrt{d-c^2dx^2}\right)\int\frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{1}{108} b^2 d^2 f x \left(1-c^2 x^2\right)^2 \sqrt{d-c^2 d x^2} + \frac{2 b d^2 g x \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{7 c \sqrt{1-c^2 x^2}} \\
&\quad - \frac{2 b c d^2 g x^3 \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{7 \sqrt{1-c^2 x^2}} + \frac{6 b c^3 d^2 g x^5 \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{35 \sqrt{1-c^2 x^2}} \\
&\quad - \frac{2 b c^5 d^2 g x^7 \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{49 \sqrt{1-c^2 x^2}} \\
&\quad + \frac{5 b d^2 f \left(1-c^2 x^2\right)^{3/2} \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{48 c} \\
&\quad + \frac{b d^2 f \left(1-c^2 x^2\right)^{5/2} \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))}{18 c} \\
&\quad + \frac{5}{16} d^2 f x \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))^2 \\
&\quad + \frac{5}{24} d^2 f x \left(1-c^2 x^2\right) \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))^2 \\
&\quad + \frac{1}{6} d^2 f x \left(1-c^2 x^2\right)^2 \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))^2 \\
&\quad - \frac{d^2 g \left(1-c^2 x^2\right)^3 \sqrt{d-c^2 d x^2} (a+b \arcsin(c x))^2}{7 c^2} \\
&\quad + \frac{\left(5 d^2 f \sqrt{d-c^2 d x^2}\right) \int \frac{(a+b \arcsin(c x))^2}{\sqrt{1-c^2 x^2}} \, dx}{16 \sqrt{1-c^2 x^2}} - \frac{\left(5 b^2 d^2 f \sqrt{d-c^2 d x^2}\right) \int \left(1-c^2 x^2\right)^{3/2} \, dx}{108 \sqrt{1-c^2 x^2}} \\
&\quad - \frac{\left(5 b^2 d^2 f \sqrt{d-c^2 d x^2}\right) \int \left(1-c^2 x^2\right)^{3/2} \, dx}{48 \sqrt{1-c^2 x^2}} \\
&\quad - \frac{\left(5 b c d^2 f \sqrt{d-c^2 d x^2}\right) \int x (a+b \arcsin(c x)) \, dx}{8 \sqrt{1-c^2 x^2}} \\
&\quad - \frac{\left(2 b^2 d^2 g \sqrt{d-c^2 d x^2}\right) \int \frac{x \left(35-35 c^2 x^2+21 c^4 x^4-5 c^6 x^6\right)}{\sqrt{1-c^2 x^2}} \, dx}{245 \sqrt{1-c^2 x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{65b^2d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} - \frac{1}{108}b^2d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} \\
&+ \frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{5bcd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} \\
&- \frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&+ \frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&+ \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&+ \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&+ \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}} - \frac{\left(5b^2d^2f\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{144\sqrt{1-c^2x^2}} \\
&- \frac{\left(5b^2d^2f\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{64\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2d^2g\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{35-35c^2x+21c^4x^2-5c^6x^3}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{245\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{245b^2d^2fx\sqrt{d-c^2dx^2}}{1152} - \frac{65b^2d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} \\
&\quad - \frac{1}{108}b^2d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} + \frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} \\
&\quad - \frac{5bcd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} - \frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad + \frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&\quad + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}} - \frac{\left(5b^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{288\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(5b^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{128\sqrt{1-c^2x^2}} + \frac{\left(5b^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d^2g\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{16}{\sqrt{1-c^2x}}+8\sqrt{1-c^2x}+6(1-c^2x)^{3/2}+5(1-c^2x)^{5/2}\right)dx,x,x^2\right)}{245\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{32b^2d^2g\sqrt{d-c^2dx^2}}{245c^2} - \frac{245b^2d^2fx\sqrt{d-c^2dx^2}}{1152} + \frac{16b^2d^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} \\
&\quad - \frac{65b^2d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} + \frac{12b^2d^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} \\
&\quad - \frac{1}{108}b^2d^2fx(1-c^2x^2)^2\sqrt{d-c^2dx^2} + \frac{2b^2d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2} \\
&\quad + \frac{115b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}} + \frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} \\
&\quad - \frac{5bcd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} - \frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad + \frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} \\
&\quad + \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} \\
&\quad + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{24}d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{6}d^2fx(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{7c^2} \\
&\quad + \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 470, normalized size of antiderivative = 0.54

$$
\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a +b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(3087000a^3cf + 88200a^2b\sqrt{1-c^2x^2}\Big(48g(-1+c^2x^2)^3 + 7c^2fx(33-26c^2
$$

```
[In] Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f + 88200*a^2*b*Sqrt[1 - c^2*x^2]*(
48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) - 840*a*b^
2*c*x*(245*c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 288*g*(-35 + 35*c^2*x^2
```

```
- 21*c^4*x^4 + 5*c^6*x^6)) + b^3*Sqrt[1 - c^2*x^2]*(-8575*c^2*f*x*(897 - 19
4*c^2*x^2 + 32*c^4*x^4) - 2304*g*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^
6*x^6)) + 105*b*(88200*a^2*c*f + 1680*a*b*Sqrt[1 - c^2*x^2]*(48*g*(-1 + c^2
*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*(-2304*g*x*(-35
+ 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) - 245*f*(-299 + 792*c^2*x^2 - 312*c^
4*x^4 + 64*c^6*x^6)))*ArcSin[c*x] + 88200*b^2*(105*a*c*f + b*Sqrt[1 - c^2*x
^2]*(48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)))*ArcS
in[c*x]^2 + 3087000*b^3*c*f*ArcSin[c*x]^3))/(29635200*b*c^2*Sqrt[1 - c^2*x^
2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.94 (sec) , antiderivative size = 2852, normalized size of antiderivative = 3.25

method	result	size
default	Expression too large to display	2852
parts	Expression too large to display	2852

```
[In] int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOS
E)
```

```
[Out] 1/6*a^2*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a^2*f*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a
^2*f*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*f*d^3/(c^2*d)^(1/2)*arctan((c^2*d)
^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/7*a^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b^2*(-5
/48*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f
*d^2+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-
c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(14*I*arcsin(
c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/6912*(-d*(c^2*x^2-1))^(1/2)*
(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^
4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2
)-6*c*x)*f*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)-5/128*(-d
*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)^2-2
+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c^2/(c
^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c
^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d
^2/c/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/
2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6*I*arcsin(c*x)+9*
arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/137200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(385*I*arcsin(c*x)+1225*arcsin(c*x)^2-92)*
cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/548800*(-d*(c^2*x^2-1))^(1/2)*(I*c
^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(630*I*arcsin(c*x)+1225*arcsin(c*x)^2-10
```

6)*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/27648*(-d*(c^2*x^2-1))^(1/2)*(I
*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(348*I*arcsin(c*x)+576*arcsin(c*x)^2-7
7)*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/27648*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(60*I*arcsin(c*x)+144*arcsin(c*x)^2-17)*
sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(30*I*arcsin(c*x)+75*arcsin(c*x)^2-14)*cos(4
*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/4800*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-
c*x*(-c^2*x^2+1)^(1/2)-I)*g*(90*I*arcsin(c*x)+75*arcsin(c*x)^2-22)*sin(4*ar
csin(c*x))*d^2/c^2/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x
*(-c^2*x^2+1)^(1/2)-I)*f*(44*I*arcsin(c*x)+32*arcsin(c*x)^2-19)*cos(3*arcsi
n(c*x))*d^2/c/(c^2*x^2-1)+9/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*f*(12*I*arcsin(c*x)+16*arcsin(c*x)^2-7)*sin(3*arcsin(c*x)
)*d^2/c/(c^2*x^2-1))+2*a*b*(-5/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/c/(c^2*x^2-1)*arcsin(c*x)^2*f*d^2+1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^
8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1
)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)
^(1/2)*x*c+1)*g*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1
))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/
2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^
2+1)^(1/2)-6*c*x)*f*(I+6*arcsin(c*x))*d^2/c/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-
1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)*d^2/c^2/(c
^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
g(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(
-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arc
sin(c*x))*d^2/c/(c^2*x^2-1)+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2
*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arc
sin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*g*(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(c
^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-
I)*g*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/4608*(-d
*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(29*I+96*arcsin(
c*x))*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/4608*(-d*(c^2*x^2-1))^(1/2)*(I
*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*(5*I+24*arcsin(c*x))*sin(5*arcsin(c*x)
)*d^2/c/(c^2*x^2-1)-1/160*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+
c^2*x^2-1)*g*(I+5*arcsin(c*x))*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/320
(-d(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(3*I+5*arcsi
n(c*x))*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)
*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*(11*I+16*arcsin(c*x))*cos(3*arcsin(
c*x))*d^2/c/(c^2*x^2-1)+9/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
x*c+c^2*x^2-1)*f*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*x^2-1))

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fr
icas")
```

```
[Out] integral((a^2*c^4*d^2*g*x^5 + a^2*c^4*d^2*f*x^4 - 2*a^2*c^2*d^2*g*x^3 - 2*a
^2*c^2*d^2*f*x^2 + a^2*d^2*g*x + a^2*d^2*f + (b^2*c^4*d^2*g*x^5 + b^2*c^4*d
^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^2*d^
2*f)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g*x^5 + a*b*c^4*d^2*f*x^4 - 2*a*b*c^2*d
^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d^2*g*x + a*b*d^2*f)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

```
[In] integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="ma
xima")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f - 1/7*(-c^2*d*x^2 +
 d)^(7/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g*x^5 + b^2*c^4*d
^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^2*d^
2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g*x^5 +
a*b*c^4*d^2*f*x^4 - 2*a*b*c^2*d^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d^2*g*x
 + a*b*d^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqr
t(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="gi
ac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,{\left(d-c^2\,d\,x^2\right)}^{5/2}\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.69 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 2989

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{52b^2d^2\sqrt{d-c^2dx^2}}{225g}$$
$$+\frac{4b^2d^2(c^2f^2-2g^2)\sqrt{d-c^2dx^2}}{9g^3}+\frac{a^2d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}$$
$$-\frac{2b^2d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5}-\frac{b^2c^2d^2fx\sqrt{d-c^2dx^2}}{64g^2}$$
$$+\frac{b^2c^2d^2f(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}}{4g^4}+\frac{b^2c^4d^2fx^3\sqrt{d-c^2dx^2}}{32g^2}+\frac{4abcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}}$$
$$-\frac{2abcd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}}+\frac{26b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675g}$$
$$+\frac{2b^2d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}}{27g^3}-\frac{2b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125g}$$
$$+\frac{2abd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}+\frac{b^2cd^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{64g^2\sqrt{1-c^2x^2}}$$
$$-\frac{b^2cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\arcsin(cx)}{4g^4\sqrt{1-c^2x^2}}+\frac{4b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{15g\sqrt{1-c^2x^2}}$$
$$-\frac{2b^2cd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5\sqrt{1-c^2x^2}}+\frac{b^2d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^5}$$
$$+\frac{2bcd^2(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3\sqrt{1-c^2x^2}}-\frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3d^2f(c^2f^2-2g^2)x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4\sqrt{1-c^2x^2}}$$
$$+\frac{2bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45g\sqrt{1-c^2x^2}}$$
$$-\frac{2bc^3d^2(c^2f^2-2g^2)x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g^3\sqrt{1-c^2x^2}}$$
$$+\frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2\sqrt{1-c^2x^2}}-\frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25g\sqrt{1-c^2x^2}}$$
$$-\frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15g}+\frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8g^2}$$
$$-\frac{c^2d^2f(c^2f^2-2g^2)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^4}-\frac{c^2d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15g}$$
$$-\frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4g^2}+\frac{c^4d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5g}$$
$$-\frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g^3}$$
$$-\frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bg^2\sqrt{1-c^2x^2}}-\frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^4\sqrt{1-c^2x^2}}$$
$$+\frac{cd^2(c^2f^2-g^2)^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg^5\sqrt{1-c^2x^2}}$$

```
[Out] b^2*d^2*(c^2*f^2-g^2)^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^5+a^2*d^2*(c^2
*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)/g^5-1/8*b*c^3*d^2*f*x^2*(a+b*arcsin(c*x))*
(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-2/9*b*c^3*d^2*(c^2*f^2-2*g^2)*x
^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)+1/8*b*c^5*
d^2*f*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-I*b
^2*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-2*
I*a*b*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-1
/6*c*d^2*f*(c^2*f^2-2*g^2)*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^4/(
-c^2*x^2+1)^(1/2)+1/3*c*d^2*(c^2*f^2-g^2)^2*x*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/g^5/(-c^2*x^2+1)^(1/2)+1/3*d^2*(c^2*f^2-g^2)^3*(a+b*arcsin(c*
x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/g^6/(g*x+f)/(-c^2*x^2+1)^(1/2)+1/3*d^2*(c^2*
f^2-g^2)^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/
g^4/(g*x+f)-2*a*b*c*d^2*(c^2*f^2-g^2)^2*x*(-c^2*d*x^2+d)^(1/2)/g^5/(-c^2*x^
2+1)^(1/2)-1/4*b^2*c*d^2*f*(c^2*f^2-2*g^2)*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)
/g^4/(-c^2*x^2+1)^(1/2)-2*b^2*c*d^2*(c^2*f^2-g^2)^2*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/g^5/(-c^2*x^2+1)^(1/2)+2/3*b*c*d^2*(c^2*f^2-2*g^2)*x*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)+52/225*b^2*d^2*(-c^2*d*
x^2+d)^(1/2)/g-2/15*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g+1/4*b^2*
c^2*d^2*f*(c^2*f^2-2*g^2)*x*(-c^2*d*x^2+d)^(1/2)/g^4-1/2*c^2*d^2*f*(c^2*f^2
-2*g^2)*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g^4+4/15*a*b*c*d^2*x*(-c
^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/64*b^2*c*d^2*f*arcsin(c*x)*(-c^2*d
*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+4/15*b^2*c*d^2*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+2/45*b*c^3*d^2*x^3*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-2/25*b*c^5*d^2*x^5*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-1/24*c*d^2*f*(a+b*arcsin(c*x))^3*(
-c^2*d*x^2+d)^(1/2)/b/g^2/(-c^2*x^2+1)^(1/2)+2*a*b*d^2*(c^2*f^2-g^2)^(5/2)*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d
*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+2*b^2*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c
*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c
^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-2*a*b*d^2*(c^2*f^2-g^2)^(5/2)*poly
log(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2
+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-2*b^2*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d
*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-2*I*b^2*d^2*(c^2*f^2-g^2)^(5/2)*polylo
g(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d
)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-a^2*d^2*(c^2*f^2-g^2)^(5/2)*arctan((c^2*f*x+
g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x
^2+1)^(1/2)+2*I*b^2*d^2*(c^2*f^2-g^2)^(5/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)
^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^
(1/2)+I*b^2*d^2*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)
^(1/2)+2/27*b^2*d^2*(c^2*f^2-2*g^2)*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/g^3-1
/15*c^2*d^2*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g+1/5*c^4*d^2*x^4*
```

```
(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g-1/3*d^2*(c^2*f^2-2*g^2)*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g^3-1/64*b^2*c^2*d^2*f*x*(-c^
2*d*x^2+d)^(1/2)/g^2+1/32*b^2*c^4*d^2*f*x^3*(-c^2*d*x^2+d)^(1/2)/g^2+2*a*b*
d^2*(c^2*f^2-g^2)^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^5+1/8*c^2*d^2*f*x*(a
+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g^2-1/4*c^4*d^2*f*x^3*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/g^2+1/2*b*c^3*d^2*f*(c^2*f^2-2*g^2)*x^2*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+2*I*a*b*d^2*(c^2*f^2-
g^2)^(5/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-2*b^2*d^2*(c^2*f^2-g
^2)^2*(-c^2*d*x^2+d)^(1/2)/g^5+26/675*b^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(
1/2)/g-2/125*b^2*d^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/g+4/9*b^2*d^2*(c^2
*f^2-2*g^2)*(-c^2*d*x^2+d)^(1/2)/g^3
```

Rubi [A] (verified)

Time = 3.20 (sec) , antiderivative size = 2989, normalized size of antiderivative = 1.00, number of steps used = 74, number of rules used = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 1.061$, Rules used = {4861, 4851, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795, 4715, 267, 272, 4849, 697, 4841, 4883, 1668, 12, 739, 210, 4881, 8, 4857, 3404, 2296, 2221, 2317, 2438,

2611, 2320, 6724}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = -\frac{2bd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^5}{25g\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2fx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^5}{8g^2\sqrt{1-c^2x^2}}+\frac{d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^4}{5g}$$
$$-\frac{d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^4}{4g^2}+\frac{b^2d^2fx^3\sqrt{d-c^2dx^2}c^4}{32g^2}$$
$$-\frac{2bd^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{9g^3\sqrt{1-c^2x^2}}$$
$$+\frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{45g\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{2g^4\sqrt{1-c^2x^2}}$$
$$-\frac{bd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c^3}{8g^2\sqrt{1-c^2x^2}}-\frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^2}{15g}$$
$$-\frac{d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^2}{2g^4}$$
$$+\frac{d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2c^2}{8g^2}+\frac{b^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}c^2}{4g^4}$$
$$-\frac{b^2d^2fx\sqrt{d-c^2dx^2}c^2}{64g^2}-\frac{d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3c}{6bg^4\sqrt{1-c^2x^2}}$$
$$+\frac{d^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3c}{3bg^5\sqrt{1-c^2x^2}}-\frac{d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3c}{24bg^2\sqrt{1-c^2x^2}}$$
$$-\frac{b^2d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\arcsin(cx)c}{4g^4\sqrt{1-c^2x^2}}-\frac{2b^2d^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}\arcsin(cx)c}{g^5\sqrt{1-c^2x^2}}$$
$$+\frac{4b^2d^2x\sqrt{d-c^2dx^2}\arcsin(cx)c}{15g\sqrt{1-c^2x^2}}+\frac{b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)c}{64g^2\sqrt{1-c^2x^2}}$$
$$+\frac{2bd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))c}{3g^3\sqrt{1-c^2x^2}}-\frac{2abd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}c}{g^5\sqrt{1-c^2x^2}}$$
$$+\frac{4abd^2x\sqrt{d-c^2dx^2}c}{15g\sqrt{1-c^2x^2}}+\frac{b^2d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g^5}$$
$$-\frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g^3}$$
$$-\frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15g}+\frac{2abd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5}$$
$$-\frac{a^2d^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{ib^2d^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$
$$+\frac{2iabd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}$$

[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]

[Out] (52*b^2*d^2*Sqrt[d - c^2*d*x^2])/(225*g) + (4*b^2*d^2*(c^2*f^2 - 2*g^2)*Sqrt[d - c^2*d*x^2])/(9*g^3) + (a^2*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2])/g^5 - (2*b^2*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2])/g^5 - (b^2*c^2*d^2*f*x*Sqrt[d - c^2*d*x^2])/(64*g^2) + (b^2*c^2*d^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[d - c^2*d*x^2])/(4*g^4) + (b^2*c^4*d^2*f*x^3*Sqrt[d - c^2*d*x^2])/(32*g^2) + (4*a*b*c*d^2*x*Sqrt[d - c^2*d*x^2])/(15*g*Sqrt[1 - c^2*x^2]) - (2*a*b*c*d^2*(c^2*f^2 - g^2)^2*x*Sqrt[d - c^2*d*x^2])/(g^5*Sqrt[1 - c^2*x^2]) + (26*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(675*g) + (2*b^2*d^2*(c^2*f^2 - 2*g^2)*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(27*g^3) - (2*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*g) + (2*a*b*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/g^5 + (b^2*c*d^2*f*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*g^2*Sqrt[1 - c^2*x^2]) - (b^2*c*d^2*f*(c^2*f^2 - 2*g^2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4*g^4*Sqrt[1 - c^2*x^2]) + (4*b^2*c*d^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(15*g*Sqrt[1 - c^2*x^2]) - (2*b^2*c*d^2*(c^2*f^2 - g^2)^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(g^5*Sqrt[1 - c^2*x^2]) + (b^2*d^2*(c^2*f^2 - g^2)^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/g^5 + (2*b*c*d^2*(c^2*f^2 - 2*g^2)*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*g^3*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*f*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*g^2*Sqrt[1 - c^2*x^2]) + (b*c^3*d^2*f*(c^2*f^2 - 2*g^2)*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*g^4*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*g*Sqrt[1 - c^2*x^2]) - (2*b*c^3*d^2*(c^2*f^2 - 2*g^2)*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*g^3*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2*f*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*g^2*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*g*Sqrt[1 - c^2*x^2]) - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) + (c^2*d^2*f*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*g^2) - (c^2*d^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*g^4) - (c^2*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) - (c^4*d^2*f*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*g^2) + (c^4*d^2*x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(5*g) - (d^2*(c^2*f^2 - 2*g^2)*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*g^3) - (c*d^2*f*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*g^2*Sqrt[1 - c^2*x^2]) - (c*d^2*f*(c^2*f^2 - 2*g^2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*g^4*Sqrt[1 - c^2*x^2]) + (c*d^2*(c^2*f^2 - g^2)^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*g^5*Sqrt[1 - c^2*x^2]) + (d^2*(c^2*f^2 - g^2)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*g^6*(f + g*x)*Sqrt[1 - c^2*x^2]) + (d^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) - (a^2*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/(g^6*Sqrt[1 - c^2*x^2]) + ((2*I)*a*b*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) + (I*b^2*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c

```
*f - Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) - ((2*I)*a*b*d^2*(c^2*f
^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x]
)*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) - (I*b^2*d^2*(c^
2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin
[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) + (2*a*b*d^
2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) + (2*b^2*d^2*(c^2
*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin
[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) - (2*a*b*d^
2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) - (2*b^2*d^2*(c^2
*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin
[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) + ((2*I)*b^
2*d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c
*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2]) - ((2*I)*b^2*
d^2*(c^2*f^2 - g^2)^(5/2)*Sqrt[d - c^2*d*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x
])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(g^6*Sqrt[1 - c^2*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
```

```
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
```

```
f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4849

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[1/(b*c*Sqrt[d]*(n + 1))
, Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[c
*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0
] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int\left(-\frac{c^2f(c^2f^2-2g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^4}+\frac{c^2(c^2f^2-2g^2)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^3}-\frac{c^4fx^2\sqrt{}}{}\right.}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(c^4d^2f\sqrt{d-c^2dx^2}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(c^4d^2\sqrt{d-c^2dx^2}\right)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g\sqrt{1-c^2x^2}}$$
$$-\frac{\left(c^2d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g^4\sqrt{1-c^2x^2}}$$
$$+\frac{\left(c^2d^2(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{g^3\sqrt{1-c^2x^2}}$$
$$+\frac{\left(d^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\right)\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{f+gx}\,dx}{g^4\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^4} \\
&- \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4g^2} + \frac{c^4d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5g} \\
&- \frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g^3} \\
&+ \frac{d^2(c^2f^2-g^2)^2\,\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bcg^4(f+gx)} \\
&- \frac{\left(c^4d^2f\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4g^2\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bc^5d^2f\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{2g^2\sqrt{1-c^2x^2}} \\
&+ \frac{\left(c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{5g\sqrt{1-c^2x^2}} \\
&- \frac{\left(2bc^5d^2\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{5g\sqrt{1-c^2x^2}} \\
&- \frac{\left(c^2d^2f(c^2f^2-2g^2)\,\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2g^4\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bc^3d^2f(c^2f^2-2g^2)\,\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{g^4\sqrt{1-c^2x^2}} \\
&+ \frac{\left(2bcd^2(c^2f^2-2g^2)\,\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3g^3\sqrt{1-c^2x^2}} \\
&- \frac{\left(d^2(c^2f^2-g^2)^2\,\sqrt{d-c^2dx^2}\right)\int\frac{(-g-2c^2fx-c^2gx^2)(a+b\arcsin(cx))^3}{(f+gx)^2}\,dx}{3bcg^4\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9g^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25g\sqrt{1-c^2x^2}} + \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8g^2} \\
&\quad - \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2g^4} \\
&\quad - \frac{c^2d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15g} \\
&\quad - \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4g^2} + \frac{c^4d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5g} \\
&\quad - \frac{d^2(c^2f^2-2g^2)\,(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3g^3} \\
&\quad - \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bg^4\sqrt{1-c^2x^2}} \\
&\quad + \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg^5\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&\quad + \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bcg^4(f+gx)} \\
&\quad - \frac{\left(c^2d^2f\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bc^3d^2f\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4g^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2c^6d^2f\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8g^2\sqrt{1-c^2x^2}} + \frac{\left(2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{15g\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2bc^3d^2\sqrt{d-c^2dx^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{15g\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2b^2c^6d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5}{\sqrt{1-c^2x^2}}\,dx}{25g\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2c^4d^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2g^4\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2c^2d^2(c^2f^2-2g^2)\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3g^3\sqrt{1-c^2x^2}} \\
&\quad \left(\frac{1}{f+gx} - \frac{c^2\left(gx+\frac{f^2}{f+gx}\right)}{\cdots}\right)(a+b\arcsin(cx))^2 \cdots
\end{aligned}
$$

= Too large to display

Mathematica [A] (verified)

Time = 3.67 (sec) , antiderivative size = 1275, normalized size of antiderivative = 0.43

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(-\frac{c^2f(c^2f^2-2g^2)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2g^4}-\frac{c^4fx^3\sqrt{1-c^2x^2}(a}{4g^2}\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-1/2*(c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x])^2)/g^4 - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x])^2)/(4*g^2) + (c^4*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(5*g) -
((c^2*f^2 - 2*g^2)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*g^3) - (c*
f*(c^2*f^2 - 2*g^2)*(a + b*ArcSin[c*x])^3)/(6*b*g^4) - ((-(c^2*f^2) + g^2)^
2*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) + (b*c*f*(c^2
*f^2 - 2*g^2)*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*Arc
Sin[c*x]))/(4*g^4) + (2*b*(c^2*f^2 - 2*g^2)*(b*Sqrt[1 - c^2*x^2]*(7 - c^2*x
^2) + 9*c*x*(a + b*ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])))/(27*g^3)
+ (b*c*f*(b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 3*b*ArcSin[c*x] + 8*c^4
*x^4*(a + b*ArcSin[c*x])))/(64*g^2) - (2*b*(b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*
x^2 + 3*c^4*x^4) + 15*c^5*x^5*(a + b*ArcSin[c*x])))/(375*g) + (c*f*(6*b*c*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*(a + b*ArcSin[c*x])^3 - 3*b^2*
(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x])))/(4
8*b*g^2) - (9*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*(b*Sqrt
[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*(a + b*ArcSin[c*x])) + 18*(Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x*
ArcSin[c*x])))/(135*g) + ((-(c^2*f^2) + g^2)^2*((c^2*f^2 - g^2)*(a + b*ArcS
in[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*x])^3 + 3*b*c*(f + g*x)*(g*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*x + b*Sqrt[1 - c^2*x^2]
 + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]*((a + b*ArcSin[c*x])^2*Log[1
+ (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c
*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)
*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f
^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g
)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])]))))/(3*b*c*g^6*(f + g*x))))/Sqrt[1 - c^2*x^2]
```

Maple [F]

$$\int \frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a+b \arcsin \left(c x \right)\right)^{2}}{g x +f}d x$$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{2}}{g x + f}\,{d x}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="fr
icas")
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\left(- d \left(c x - 1\right) \left(c x + 1\right)\right)^{\frac{5}{2}} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}{f + g x}\, dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/(g*x+f),x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="ma
xima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for more d
etails)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))^2}{f + gx} dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))^2}{f + gx} dx = \int \frac{(a + b \operatorname{asin}(c\,x))^2 (d - c^2\,d\,x^2)^{5/2}}{f + g\,x} dx$$

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)

3.70 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 692

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{6b^2f^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{14b^2g^3(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} + \frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} - \frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}}$$

```
[Out] 6*b^2*f^2*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+14/9*b^2*g^3*(-c^2*x^2+1)
/c^4/(-c^2*d*x^2+d)^(1/2)+3/4*b^2*f*g^2*x*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(
1/2)-2/27*b^2*g^3*(-c^2*x^2+1)^2/c^4/(-c^2*d*x^2+d)^(1/2)-3*f^2*g*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)-2/3*g^3*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c^4/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*x*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)-1/3*g^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x
))^2/c^2/(-c^2*d*x^2+d)^(1/2)-3/4*b^2*f*g^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/
c^3/(-c^2*d*x^2+d)^(1/2)+6*b*f^2*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
/(-c^2*d*x^2+d)^(1/2)+4/3*b*g^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/
(-c^2*d*x^2+d)^(1/2)+3/2*b*f*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
/(-c^2*d*x^2+d)^(1/2)+2/9*b*g^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/
```

```
(-c^2*d*x^2+d)^(1/2)+1/3*f^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-c
^2*d*x^2+d)^(1/2)+1/2*f*g^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(-
c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 692, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {4861, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8, 2713}

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx = & \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} \\ & -\frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} \\ & +\frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} \\ & -\frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} \\ & +\frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} \\ & -\frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} \\ & +\frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} \\ & -\frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} \\ & +\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}} \\ & +\frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} \\ & -\frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} \\ & +\frac{6b^2f^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} \\ & -\frac{2b^2g^3(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}}+\frac{14b^2g^3(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (6*b^2*f^2*g*(1 - c^2*x^2))/(c^2*Sqrt[d - c^2*d*x^2]) + (14*b^2*g^3*(1 - c^
2*x^2))/(9*c^4*Sqrt[d - c^2*d*x^2]) + (3*b^2*f*g^2*x*(1 - c^2*x^2))/(4*c^2*
Sqrt[d - c^2*d*x^2]) - (2*b^2*g^3*(1 - c^2*x^2)^2)/(27*c^4*Sqrt[d - c^2*d*x
```

```
^2]) - (3*b^2*f*g^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(4*c^3*Sqrt[d - c^2*d*x^
2]) + (6*b*f^2*g*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*Sqrt[d - c^2*d
*x^2]) + (4*b*g^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^3*Sqrt[d -
c^2*d*x^2]) + (3*b*f*g^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c*Sq
rt[d - c^2*d*x^2]) + (2*b*g^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9
*c*Sqrt[d - c^2*d*x^2]) - (3*f^2*g*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c^
2*Sqrt[d - c^2*d*x^2]) - (2*g^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c^4
*Sqrt[d - c^2*d*x^2]) - (3*f*g^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*
c^2*Sqrt[d - c^2*d*x^2]) - (g^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3
*c^2*Sqrt[d - c^2*d*x^2]) + (f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(
3*b*c*Sqrt[d - c^2*d*x^2]) + (f*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3
)/(2*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2(cf+g\sin(x))^3\,dx, x, \arcsin(cx)\right)}{c^4\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \left(c^3f^3(a+bx)^2+3c^2f^2g(a+bx)^2\sin(x)+3cfg^2(a+bx)^2\sin^2(x)+g^3(a+bx\right.\right.}{c^4\sqrt{d-c^2dx^2}}$$

$$= \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{(3f^2g\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{(3fg^2\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)^2\sin^2(x)\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d-c^2dx^2}} + \frac{(g^3\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)^2\sin^3(x)\,dx,x,\arcsin(cx)\right)}{c^4\sqrt{d-c^2dx^2}}$$

$$= \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{(6bf^2g\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{(3fg^2\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)^2\,dx,x,\arcsin(cx)\right)}{2c^3\sqrt{d-c^2dx^2}} - \frac{(3b^2fg^2\sqrt{1-c^2x^2})\,\text{Subst}\left(\int\sin^2(x)\,dx,x,\arcsin(cx)\right)}{2c^3\sqrt{d-c^2dx^2}} + \frac{(2g^3\sqrt{1-c^2x^2})\,\text{Subst}\left(\int(a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{3c^4\sqrt{d-c^2dx^2}} - \frac{(2b^2g^3\sqrt{1-c^2x^2})\,\text{Subst}\left(\int\sin^3(x)\,dx,x,\arcsin(cx)\right)}{9c^4\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} \\
&\quad + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3f^2g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3fg^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(6b^2f^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(3b^2fg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\arcsin(cx)\right)}{4c^3\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4bg^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{3c^4\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2b^2g^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,\sqrt{1-c^2x^2}\right)}{9c^4\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{6b^2f^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{2b^2g^3(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} + \frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2b^2g^3(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} - \frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} \\
&\quad + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} \\
&\quad + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3f^2g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3fg^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(4b^2g^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{3c^4\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{6b^2f^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{14b^2g^3(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} + \frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} - \frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.57 (sec) , antiderivative size = 582, normalized size of antiderivative = 0.84

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{-36a^2d(1-c^2x^2)^{3/2}(4g^3+c^2g(18f^2+9fgx+2g^2x^2)) - 216abc^3df^3(-1+c^2x^2)\arcsin(cx)^2 - 72b^2c^3df^3(}{}$$

```
[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-36*a^2*d*(1 - c^2*x^2)^(3/2)*(4*g^3 + c^2*g*(18*f^2 + 9*f*g*x + 2*g^2*x^2
)) - 216*a*b*c^3*d*f^3*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 72*b^2*c^3*d*f^3*(-1
+ c^2*x^2)*ArcSin[c*x]^3 - 1296*a*b*c^2*d*f^2*g*(-1 + c^2*x^2)*(c*x - Sqrt[
1 - c^2*x^2]*ArcSin[c*x]) - 48*a*b*d*g^3*(-1 + c^2*x^2)*(6*c*x + c^3*x^3 -
3*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]) + 648*b^2*c^2*d*f^2*g*(1 - c
^2*x^2)*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2)) - 108*
a^2*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*A
rcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 162*a*b*c*d*f*g
^2*(-1 + c^2*x^2)*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Si
n[2*ArcSin[c*x]]) + 27*b^2*c*d*f*g^2*(1 - c^2*x^2)*(4*ArcSin[c*x]^3 - 6*Arc
Sin[c*x]*Cos[2*ArcSin[c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]) - 2
*b^2*d*g^3*(1 - c^2*x^2)*(81*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) - (-2 +
 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] + 6*ArcSin[c*x]*(-27*c*x + Sin[3*ArcSi
n[c*x]])))/(216*c^4*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.81 (sec) , antiderivative size = 1636, normalized size of antiderivative = 2.36

method	result	size
default	Expression too large to display	1636
parts	Expression too large to display	1636

```
[In] int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-1
/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(
-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3*f*(
2*c^2*f^2+3*g^2)+1/432*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+
1)^(1/2)-1)*g^3*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)-3/8*(
-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(8*I*arcsin(c*
x)*c^2*f^2+4*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+arcsin(c*x)^2*g^2-8*
c^2*f^2-2*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*g*(4*arcsin(c*x)^2*c^2*f^2-8*I*arcsin(c*x)*c^2*f^2+ar
csin(c*x)^2*g^2-2*I*arcsin(c*x)*g^2-8*c^2*f^2-2*g^2)/c^4/d/(c^2*x^2-1)+1/43
2*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*g^3*(-6*I
*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)+3/8*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2*f*arcsin(c*x)+3/16*(-d*(c^2*x^2-
1))^(1/2)/c^2/d/(c^2*x^2-1)*g^2*f*(2*arcsin(c*x)^2-1)*x-1/216*(-d*(c^2*x^2-
1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*(9*arcsin(c*x)^2-2)*cos(4*arcsin(c*x))+1/36
*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^3*sin(4*arcsin(c*x)
)+3/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*f*arcsin(c*x)*cos(3*arcs
in(c*x))+3/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*f*(2*arcsin(c*x)
^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2*f^2+3*g^2)+1/144*(-d*(c^2*x^2
-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*g^3*(I+3*arcsin(c*x))/c
^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x
*c-1)*g*(4*arcsin(c*x)*c^2*f^2+4*I*c^2*f^2+arcsin(c*x)*g^2+I*g^2)/c^4/d/(c^
2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*
(4*arcsin(c*x)*c^2*f^2-4*I*c^2*f^2+arcsin(c*x)*g^2-I*g^2)/c^4/d/(c^2*x^2-1)
+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*g^3*
(-I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)+3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2+3/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-
1)*f*g^2*arcsin(c*x)*x-1/24*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin
(c*x)*g^3*cos(4*arcsin(c*x))+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*
g^3*sin(4*arcsin(c*x))+3/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*
```

```
cos(3*arcsin(c*x))+3/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*arcsi
n(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b*
g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/3*a^2*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^
4*d)) - 3/2*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sq
rt(d))) + a*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 6*a*b*f^2*g*x/(c*sqrt(d)) + a
^2*f^3*arcsin(c*x)/(c*sqrt(d)) - 6*sqrt(-c^2*d*x^2 + d)*a*b*f^2*g*arcsin(c*
x)/(c^2*d) - 3*sqrt(-c^2*d*x^2 + d)*a^2*f^2*g/(c^2*d) - sqrt(d)*integrate((
(b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^2 -
d), x)
```

Giac [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
[Out] integrate((g*x + f)^3*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.71 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{4b^2fg(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{b^2g^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} \\ &\quad -\frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} \\ &\quad +\frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} \\ &\quad +\frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} \\ &\quad -\frac{2fg(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} \\ &\quad -\frac{g^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} \\ &\quad +\frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} \\ &\quad +\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 4*b^2*f*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*g^2*x*(-c^2*x^2+1)/
c^2/(-c^2*d*x^2+d)^(1/2)-2*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2*d
*x^2+d)^(1/2)-1/2*g^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2*d*x^2+d)
^(1/2)-1/4*b^2*g^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+
4*b*f*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/2*b
*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/3*f^
2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)+1/6*g^2*(
a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4861, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} + \frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{4b^2fg(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (4*b^2*f*g*(1 - c^2*x^2))/(c^2*Sqrt[d - c^2*d*x^2]) + (b^2*g^2*x*(1 - c^2*x
^2))/(4*c^2*Sqrt[d - c^2*d*x^2]) - (b^2*g^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(4*c^3*Sqrt[d - c^2*d*x^2]) + (4*b*f*g*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]))/(c*Sqrt[d - c^2*d*x^2]) + (b*g^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x]))/(2*c*Sqrt[d - c^2*d*x^2]) - (2*f*g*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^
2)/(c^2*Sqrt[d - c^2*d*x^2]) - (g^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/
(2*c^2*Sqrt[d - c^2*d*x^2]) + (f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)
/(3*b*c*Sqrt[d - c^2*d*x^2]) + (g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3
)/(6*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
```

```
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int\frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int(a+bx)^2(cf+g\sin(x))^2\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int\left(c^2f^2(a+bx)^2+2cfg(a+bx)^2\sin(x)+g^2(a+bx)^2\sin^2(x)\right)\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{\left(2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{\left(g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\sin^2(x)\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{\left(4bfg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} + \frac{\left(g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\,dx,x,\arcsin(cx)\right)}{2c^3\sqrt{d-c^2dx^2}} - \frac{\left(b^2g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin^2(x)\,dx,x,\arcsin(cx)\right)}{2c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2g^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} + \frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}} - \frac{\left(4b^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}} - \frac{\left(b^2g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\arcsin(cx)\right)}{4c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{4b^2fg(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 400, normalized size of antiderivative = 0.98

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{-4b^2\sqrt{d}(2c^2f^2+g^2)(-1+c^2x^2)\arcsin(cx)^3 - 12a^2(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right.}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-4*b^2*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^3 - 12*a^2*(2*
c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c
^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcSin[
c*x]*(16*c*f*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]] + 2*
a*g*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-8*a*b*c*f*x - 8
*b^2*f*Sqrt[1 - c^2*x^2] + a^2*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + 2*a*b*g*Cos
[2*ArcSin[c*x]] - b^2*g*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d]*(-1 + c^2*x^2)*Ar
cSin[c*x]^2*(-2*a*(2*c^2*f^2 + g^2) + 8*b*c*f*g*Sqrt[1 - c^2*x^2] + b*g^2*S
in[2*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.70 (sec) , antiderivative size = 928, normalized size of antiderivative = 2.26

method	result
default	$a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b^2\left(-\frac{\sqrt{-d(c^2}}{}\right.$
parts	$a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b^2\left(-\frac{\sqrt{-d(c^2}}{}\right.$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-1
/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*
x/(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3*(2*c^2*
f^2+g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(a
rcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I
*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^
2/d/(c^2*x^2-1)+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^
2-1)*arcsin(c*x)*g^2+1/16*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*g^2*(2*a
rcsin(c*x)^2-1)*x+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*
g^2*cos(3*arcsin(c*x))+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*(2
*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*f^2+g^2)-(-d*(c^2*x
^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)/c^2/d
/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*
g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*
g^2*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*cos(3*a
rcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*arcsin(c*x)*si
n(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin(
c*x))*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
[Out] -1/2*a^2*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) +
 a*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + 4*a*b*f*g*x/(c*sqrt(d)) + a^2*f^2*arcs
in(c*x)/(c*sqrt(d)) - 4*sqrt(-c^2*d*x^2 + d)*a*b*f*g*arcsin(c*x)/(c^2*d) -
2*sqrt(-c^2*d*x^2 + d)*a^2*f*g/(c^2*d) - sqrt(d)*integrate((2*a*b*g^2*x^2*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g^2*x^2 + 2*b^2*f*g*x + b^
2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)*sqrt(c*x + 1)*sqrt(-c*
x + 1)/(c^2*d*x^2 - d), x)
```

Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
[Out] integrate((g*x + f)^2*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.72 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 171

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{2b^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{2bgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

```
[Out] 2*b^2*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)-g*(-c^2*x^2+1)*(a+b*arcsin(c*
x))^2/c^2/(-c^2*d*x^2+d)^(1/2)+2*b*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
/c/(-c^2*d*x^2+d)^(1/2)+1/3*f*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-
c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.21, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {4861, 4847, 4737, 4767, 4715, 267}

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} + \frac{2abgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2gx\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}} + \frac{2b^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*a*b*g*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b^2*g*(1 - c^2*x
^2))/(c^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*g*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(c*Sqrt[d - c^2*d*x^2]) - (g*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c^2*Sqrt
[d - c^2*d*x^2]) + (f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[
d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
```

```
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}+\frac{\left(g\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= -\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2bg\sqrt{1-c^2x^2}\right)\int (a+b\arcsin(cx))\,dx}{c\sqrt{d-c^2dx^2}}\\
&= \frac{2abgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}+\frac{\left(2b^2g\sqrt{1-c^2x^2}\right)\int \arcsin(cx)\,dx}{c\sqrt{d-c^2dx^2}}\\
&= \frac{2abgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2gx\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}}-\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}-\frac{\left(2b^2g\sqrt{1-c^2x^2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{2abgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{2b^2gx\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}}\\
&\quad-\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.68 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.69

$$
\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx
= \frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c}+\frac{f(a+b\arcsin(cx))^3}{3b}+\frac{2bg\left(acx+b\sqrt{1-c^2x^2}+bcx\arcsin(cx)\right)}{c}\right)}{c\sqrt{d-c^2dx^2}}
$$

[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]

[Out] (Sqrt[1 - c^2*x^2]*(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c) + (f*(a + b*ArcSin[c*x])^3)/(3*b) + (2*b*g*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]))/c))/(c*Sqrt[d - c^2*d*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 460, normalized size of antiderivative = 2.69

method	result
default	$\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{\sqrt{c^2 d}} - \frac{a^2 g\sqrt{-c^2 d\,x^2+d}}{c^2 d} + b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)} - \frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\right.}{}\right.$
parts	$\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{\sqrt{c^2 d}} - \frac{a^2 g\sqrt{-c^2 d\,x^2+d}}{c^2 d} + b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)} - \frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\right.}{}\right.$

[In] int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] a^2*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^3*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1))

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^2*d*x^2 - d), x)

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.08

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{b^2f\arcsin{(cx)}^3}{3\,c\sqrt{d}} + 2\,b^2g\left(\frac{x\arcsin{(cx)}}{c\sqrt{d}} + \frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right) + \frac{abf\arcsin{(cx)}^2}{c\sqrt{d}} + \frac{2\,abgx}{c\sqrt{d}} + \frac{a^2f\arcsin{(cx)}}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}b^2g\arcsin{(cx)}^2}{c^2d} - \frac{2\sqrt{-c^2dx^2+d}abg\arcsin{(cx)}}{c^2d} - \frac{\sqrt{-c^2dx^2+d}a^2g}{c^2d}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")
```

```
[Out] 1/3*b^2*f*arcsin(c*x)^3/(c*sqrt(d)) + 2*b^2*g*(x*arcsin(c*x)/(c*sqrt(d)) +
sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + a*b*f*arcsin(c*x)^2/(c*sqrt(d)) + 2*a*b
*g*x/(c*sqrt(d)) + a^2*f*arcsin(c*x)/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b^2
*g*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*b*g*arcsin(c*x)/(c^2*d)
 - sqrt(-c^2*d*x^2 + d)*a^2*g/(c^2*d)
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.73 $\int \frac{(a+b \arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 589

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

```
[Out] -I*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*(a
+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1
/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*b*(a+b*
arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1
/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*
arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1
/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*p
olylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^
```

```
2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(3,I*(I*
c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^
2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 589, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {4861, 4857, 3404, 2296, 2221, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}\sqrt{c^2f^2-g^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-I)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*
g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
+ (I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g
)/(c*f + Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) -
 (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
 + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x
])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2
]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f -
 Sqrt[c^2*f^2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2]) + ((2*I)*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^
2 - g^2])])/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
```

```
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}} \\
&= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \frac{(a+bx)^2}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}} \\
&= \frac{\left(2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2ce^{ix}f+ig-ie^{2ix}g}\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}} \\
&= -\frac{\left(2ig\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ig\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}\left(2,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}\left(2,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 357, normalized size of antiderivative = 0.61

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx =$$
$$-\frac{i\sqrt{1-c^2x^2}\left((a+b\arcsin(cx))^2\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-2\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-I)*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])
*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I
*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*
(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2]
)]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \frac{(a+b\arcsin{(cx)})^2}{(gx+f)\sqrt{-c^2d\,x^2+d}}dx$$

[In] int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)

[Out] int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="fr
icas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*g*x^3 + c^2*d*f*x^2 - d*g*x - d*f), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})^2}{\sqrt{-d\,(cx-1)\,(cx+1)}\,(f+gx)}\,dx$$

[In] integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="ma
xima")

[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{(f+g\,x)\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

3.74 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1113

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}} - \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

```
[Out] g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c^2*f^2-g^2)/(g*x+f)/(-c^2*d*x^2+d)^(1/
2)+I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^
(1/2)-2*b*c*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2
*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-I*c
^2*f*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-
g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*
```

```
b*c*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2
)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+I*c^2*f*(a+
b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/
2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x
^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-2*b*c^2*f*(a+b*arcsin(c*x))*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x
^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/
(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+2*b*c^2*f*(a+b*arcsin(c*x))*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/
(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*c^2*f*polylog(3,I*(I*c*x+(
-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2
-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c^2*f*polylog(3,I*(I*c*x+(-c^2*x^2
+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3
/2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.96 (sec) , antiderivative size = 1113, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules

used = {4861, 4857, 3405, 3404, 2296, 2221, 2611, 2320, 6724, 4615, 2317, 2438}

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{2ic\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{2ic\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{2ic^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b^2}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ic^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b^2}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2c\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{2c\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{2c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}} + \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (I*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/((c^2*f^2 - g^2)*Sqrt[d - c^2
*d*x^2]) + (g*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((c^2*f^2 - g^2)*(f + g*
x)*Sqrt[d - c^2*d*x^2]) - (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[
1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)*
Sqrt[d - c^2*d*x^2]) - (I*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Log
[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)
```

```
^(3/2)*Sqrt[d - c^2*d*x^2]) - (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g
^2)*Sqrt[d - c^2*d*x^2]) + (I*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 -
g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)*Sqr
t[d - c^2*d*x^2]) - (2*b*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLo
g[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)
^(3/2)*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, (I*
E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)*Sqrt[d
- c^2*d*x^2]) + (2*b*c^2*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)^(3/
2)*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*c^2*f*Sqrt[1 - c^2*x^2]*PolyLog[3, (I*
E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)^(3/2)*S
qrt[d - c^2*d*x^2]) + ((2*I)*b^2*c^2*f*Sqrt[1 - c^2*x^2]*PolyLog[3, (I*E^(I
*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c^2*f^2 - g^2)^(3/2)*Sqrt[
d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
```

```
Q[m, 0] || IGtQ[n, 0])
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{(cf+g\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} + \frac{\left(c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{\left(2bcg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} + \frac{\left(2c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2ce^{ix}f+ig-ie^{2ix}g}\,dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{\left(2bcg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{cf-ie^{ix}g-\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{\left(2bcg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{cf-ie^{ix}g+\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}$$

$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2ic^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2ic^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}$$

$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$- \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$+ \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2ibc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2ibc^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}} \\
&- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\
&- \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\
&+ \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\
&- \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\
&+ \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2b^2c^2f\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int \mathrm{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b^2c^2f\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int \mathrm{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}$$
$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(2ib^2c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2ib^2c^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

$$=\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}+\frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}}$$
$$-\frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$-\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+\frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$-\frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+\frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2c^2f\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2c^2f\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 651, normalized size of antiderivative = 0.58

$$\int\frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$$
$$=\frac{c\sqrt{1-c^2x^2}\left(i(a+b\arcsin(cx))^2+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cf+cgx}-2b(a+b\arcsin(cx))\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

[Out] (c*Sqrt[1 - c^2*x^2]*(I*(a + b*ArcSin[c*x])^2 + (g*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x])^2)/(c*f + c*g*x) - 2*b*(a + b*ArcSin[c*x])*Log[1 + (I*E^(I*Ar
cSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - 2*b*(a + b*ArcSin[c*x])*Log
[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2*PolyL
og[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2*Poly
Log[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (I*c*f*((a +
b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g
^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f -
Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2] + (c*f*(2*b*(a + b*ArcSin[c*x])
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + I*((a +
b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2]
)] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])
))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt[d - c^2*d*x^2])

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)^2\sqrt{-c^2d\,x^2+d}}dx$$

[In] int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)

[Out] int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*g^2*x^4 + 2*c^2*d*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g^2
)*x^2), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}(f+gx)^2}\,dx$$

[In] integrate((a+b*asin(c*x))**2/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2), x)

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(f+g\,x\right)^2\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.75 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 738

$$\begin{aligned}
\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} \\
&- \frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{g(3c^2f^2+g^2)\,(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{f\left(f^2+\frac{3g^2}{c^2}\right)x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&- \frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&+ \frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}
\end{aligned}$$

```
[Out] -2*b^2*g^3*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+g*(3*c^2*f^2+g^2)*(a+b*a
rcsin(c*x))^2/c^4/d/(-c^2*d*x^2+d)^(1/2)+f*(f^2+3*g^2/c^2)*x*(a+b*arcsin(c*
```

```
x))^2/d/(-c^2*d*x^2+d)^(1/2)+g^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^4/d/(-c
^2*d*x^2+d)^(1/2)-2*a*b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
-2*b^2*g^3*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-I*f*
(c^2*f^2+3*g^2)*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)
^(1/2)-f*g^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^
(1/2)+4*I*b*g*(3*c^2*f^2+g^2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(
1/2))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(c^2*f^2+3*g^2)*(
a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/
d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*g*(3*c^2*f^2+g^2)*polylog(2,-I*(I*c*x+(-c^2*
x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*g*(3*c
^2*f^2+g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/
d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*(c^2*f^2+3*g^2)*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 738, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.455$, Rules used = {4861, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267}

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{4ibg\sqrt{1-c^2x^2}(3c^2f^2+g^2)\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{fx\left(\frac{3g^2}{c^2}+f^2\right)(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(c^2f^2+3g^2)(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bf\sqrt{1-c^2x^2}(c^2f^2+3g^2)\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} - \frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2ib^2g\sqrt{1-c^2x^2}(3c^2f^2+g^2)\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2ib^2g\sqrt{1-c^2x^2}(3c^2f^2+g^2)\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{ib^2f\sqrt{1-c^2x^2}(c^2f^2+3g^2)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-2*a*b*g^3*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*g^3*(
1 - c^2*x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*g^3*x*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(c^3*d*Sqrt[d - c^2*d*x^2]) + (g*(3*c^2*f^2 + g^2)*(a + b*ArcS
in[c*x])^2)/(c^4*d*Sqrt[d - c^2*d*x^2]) + (f*(f^2 + (3*g^2)/c^2)*x*(a + b*A
rcSin[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*f*(c^2*f^2 + 3*g^2)*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) + (g^3*(1 - c^2*x
^2)*(a + b*ArcSin[c*x])^2)/(c^4*d*Sqrt[d - c^2*d*x^2]) - (f*g^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^3)/(b*c^3*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*g*(3
*c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*
x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + (2*b*f*(c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2
*d*x^2]) - ((2*I)*b^2*g*(3*c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*g*(3*c^2*f^2
+ g^2)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c
^2*d*x^2]) - (I*b^2*f*(c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2
*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{(c^2f^3+3fg^2+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}}-\frac{3fg^2(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}-\frac{g^3x(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \frac{(c^2f^3+3fg^2+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}\\
&\quad -\frac{\left(3fg^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}-\frac{\left(g^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$=\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}\int\left(\frac{c^2f^3\left(1+\frac{3g^2}{c^2f^2}\right)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{g(3c^2f^2+g^2)x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{c^2d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2bg^3\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{c^3d\sqrt{d-c^2dx^2}}$$

$$=-\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}+\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}$$
$$-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}-\frac{\left(2b^2g^3\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{c^3d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$=-\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}}$$
$$+\frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}+\frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}$$
$$+\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(2b^2g^3\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}-\frac{\left(2bg(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{c^3d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$=-\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}}$$
$$+\frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}+\frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}$$
$$+\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2bg(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} + \frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(4ibf(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} + \frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$=-\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}}+\frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}+\frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}+\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}+\frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{\left(ib^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$=-\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}-\frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}}+\frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}+\frac{f(c^2f^2+3g^2)x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}+\frac{g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}}-\frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}}+\frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}-\frac{ib^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 2.52 (sec) , antiderivative size = 325, normalized size of antiderivative = 0.44

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2cfg^2(a+b\arcsin(cx))^3}{b}-4b\right.}{}$$

[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]

[Out] (Sqrt[1 - c^2*x^2]*(2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*c*f*g^2*(a + b*ArcSin[c*x])^3)/b - 4*b*g^3*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + (c*f - g)^3*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f + g)^3*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1527 vs. 2(731) = 1462.

Time = 1.19 (sec) , antiderivative size = 1528, normalized size of antiderivative = 2.07

method	result	size
default	Expression too large to display	1528
parts	Expression too large to display	1528

[In] int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a^2*(f^3/d*x/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b^2*((-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/d^2/c^4/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g^3*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/d^2/c^4/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f^3*x+3*I*(-c^2*x^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I*arcsin(c*x)^2*c^3*f^3+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3*f^3-2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x)*c^3*f^3+6*I*arcsin(c*x)^2*c*f*g^2-6*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1

)^(1/2)))*c^2*f^2*g+6*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+6*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g-6*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+3*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c*f*g^2-6*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x)*c*f*g^2-2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3-2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3)/d^2/c^4/(c^2*x^2-1))+2*a*b*(3/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(arcsin(c*x)+I)/d^2/c^4/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g^3*(arcsin(c*x)-I)/d^2/c^4/(c^2*x^2-1)+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*f*(c^2*f^2+3*g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f^3*x+3*I*(-c^2*x^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(c^3*f^3-3*c^2*f^2*g+3*c*f*g^2-g^3)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^2/c^4/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^4/(c^2*x^2-1)*(c^3*f^3+3*c^2*f^2*g+3*c*f*g^2+g^3)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^3}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -a^2*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d)
) + 3*a^2*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))
) + 2*a*b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^3*x/(sqrt(-c^2
*d*x^2 + d)*d) - a*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a^2*f^2*g/(sqrt(-
c^2*d*x^2 + d)*c^2*d) - sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 +
 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*
(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="
giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.76 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 513

$$\begin{aligned}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}\\ &+\frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}\\ &-\frac{i(c^2f^2+g^2)\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}-\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}\\ &+\frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}\\ &+\frac{2b(c^2f^2+g^2)\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}\\ &-\frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}\\ &+\frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}\\ &-\frac{ib^2(c^2f^2+g^2)\,\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 2*f*g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+(c^2*f^2+g^2)*x*(a+b*a
rcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*(c^2*f^2+g^2)*(a+b*arcsin(c*x))^
2*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-1/3*g^2*(a+b*arcsin(c*x))^3
*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+8*I*b*f*g*(a+b*arcsin(c*x)
)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^
(1/2)+2*b*(c^2*f^2+g^2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-4*I*b^2*f*g*polylog(2,-I*(I
```

```
*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)+4*I
*b^2*f*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(
-c^2*d*x^2+d)^(1/2)-I*b^2*(c^2*f^2+g^2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2
))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 513, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.394$, Rules used = {4861, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{8ibfg\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{x(c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(c^2f^2+g^2)\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} - \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}(c^2f^2+g^2)\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (2*f*g*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((c^2*f^2 + g^2
)*x*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*(c^2*f^2 + g^2)
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) - (g^
2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^3*d*Sqrt[d - c^2*d*x^2])
+ ((8*I)*b*f*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x
])])/(c^2*d*Sqrt[d - c^2*d*x^2]) + (2*b*(c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2*d*x^
2]) - ((4*I)*b^2*f*g*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/
(c^2*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b^2*f*g*Sqrt[1 - c^2*x^2]*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*(c^2*f^2 + g^2)*S
qrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2*d*
x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{(c^2f^2+g^2+2c^2fgx)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}} - \frac{g^2(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \frac{(c^2f^2+g^2+2c^2fgx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\int \left(\frac{c^2f^2\left(1+\frac{g^2}{c^2f^2}\right)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} + \frac{2c^2fgx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{\left(2fg\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}} + \frac{\left((c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(4bfg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}} - \frac{\left(2b(c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(4bfg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b(c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(4b^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(4b^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(4ib(c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2b(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(4ib^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(4ib^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2(c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2b(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(ib^2(c^2f^2+g^2)\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2b(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{ib^2(c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.58 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.50

$$\int\frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{2g^2(a+b\arcsin(cx))^3}{b}+3(-cf+g)^2\left(-(a+b\arcsin(cx))^2\cot\left(\right.\right.\right.}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
[Out] (Sqrt[1 - c^2*x^2]*((-2*g^2*(a + b*ArcSin[c*x])^3)/b + 3*(-(c*f) + g)^2*(-(
(a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]) + I*((a + b*ArcSin[c*x])
```

```
*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog
[2, (-I)/E^(I*ArcSin[c*x])])) - 3*(c*f + g)^2*(I*((a + b*ArcSin[c*x])*(a +
b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])
))/(6*c^3*d*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 1.08 (sec) , antiderivative size = 975, normalized size of antiderivative = 1.90

method	result
default	$a^2\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2}}{3d^2c^3(c^2}\right.$
parts	$a^2\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2}}{3d^2c^3(c^2}\right.$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERB
OSE)
```

```
[Out] a^2*(f^2/d*x/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/(-
c^2*d*x^2+d)^(1/2))+b^2*(1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/
c^3/(c^2*x^2-1)*g^2*arcsin(c*x)^3-(-d*(c^2*x^2-1))^(1/2)*(c*x+I*(-c^2*x^2+1
)^(1/2))*arcsin(c*x)^2*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)*c*f*g+2*x*c^2*f*
g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(-2*I*arcs
in(c*x)^2*c^2*f^2+2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x)*c^2*f^2-
I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^2*f^2+4*ln(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2)))*arcsin(c*x)*c*f*g-4*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*arcsin(
c*x)*c*f*g-4*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g+4*I*dilog(1-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g-2*I*arcsin(c*x)^2*g^2+2*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))^2)*arcsin(c*x)*g^2-I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*
g^2)/d^2/c^3/(c^2*x^2-1))+2*a*b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1
/2)/d^2/c^3/(c^2*x^2-1)*g^2*arcsin(c*x)^2+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x
^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))
^(1/2)*(c*x+I*(-c^2*x^2+1)^(1/2))*arcsin(c*x)*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)
^(1/2)*c*f*g+2*x*c^2*f*g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2-2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1
)^(1/2)+I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c
^2*f^2+2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})^2\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] a^2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + 2*a*b*f^2*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^2*x/(sqrt(-c^2*d*x^2 + d)*d) - a*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) - sqrt(d)*integrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 2*a^2*f*g/(sqrt(-c^2*d*x^2 + d)*c^2*d)

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="
giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.77 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} \\ &+ \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} \\ &- \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{ib^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+f*x*(a+b*arcsin(c*x))^2/d/
(-c^2*d*x^2+d)^(1/2)-I*f*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d
*x^2+d)^(1/2)+4*I*b*g*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-
c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)-2*I
*b^2*g*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(-
c^2*d*x^2+d)^(1/2)+2*I*b^2*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*
x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*polylog(2,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {4861, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266}

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{4ibg\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2bf\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd\sqrt{d-c^2dx^2}} + \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{ib^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} - \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (g*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) + (f*x*(a + b*ArcSin[
c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^2)/(c*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2]) + (2*b*f*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*d*Sqr
t[d - c^2*d*x^2]) - ((2*I)*b^2*g*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*g*Sqrt[1 - c^2*x^2]*Po
lyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*f*Sqrt[
1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}+\frac{\left(g\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2bcf\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}-\frac{\left(2bg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2bf\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}} - \frac{\left(2bg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(4ibf\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}} + \frac{\left(2b^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} - \frac{\left(2b^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} - \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(ib^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ib^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.00 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.58

$$
\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-(a+b\arcsin(cx))^2\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)+i\right.\right.}{}
$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c
*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E^
(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f + g)*
(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[
c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*x])^2
*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 1.20 (sec) , antiderivative size = 612, normalized size of antiderivative = 1.49

method	result
default	$a^2\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d}}{}\right.$
parts	$a^2\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d}}{}\right.$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOS
E)
```

```
[Out] a^2*(f/d*x/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b^2*(-(-d*(c^
2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c*f
+c^2*f*x+g)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(2*I*arcsin(c*x)^2*c*
f+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c*f-2*arcsin(c*x)*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))^2)*c*f+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g-2*I*
dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g-2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))*g+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g)/d^2/c^2
/(c^2*x^2-1))+2*a*b*(2*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c/(c
^2*x^2-1)*f*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c
*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+c^2*f*x+g)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)*(c*f-g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-1)-(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*(c*f+g)*ln(I*c*x+(-c^
2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c
*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2
), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})^2\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] 2*a*b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f*x/(sqrt(-c^2*d*x^2 + d)*d) - sqrt(d)*integrate((2*a*b*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g*x + b^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - a*b*f*log(x^2 - 1/c^2)/(c*d^(3/2)) + a^2*g/(sqrt(-c^2*d*x^2 + d)*c^2*d)

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

[In] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)

[Out] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)

3.78 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1137

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} + \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2g^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2ib^2g^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

```
[Out] -1/2*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2
)+1/2*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/
2)-1/2*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d
```

```
/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2
+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcs
in(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f-g)/(-
c^2*d*x^2+d)^(1/2)+I*g^2*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(
-c^2*d*x^2+d)^(1/2)-I*g^2*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/
(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*
x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,I*(I*c*x+(-c^
2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+2*b*g^2*
(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*
b*g^2*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*
f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1
/2)+2*I*b^2*g^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)
^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*I*
b^2*g^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))
*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+1/2*(a+b*arc
sin(c*x))^2*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*arcsin(c*x))/d/(c*f+g)/(-c^2*
d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 1.34 (sec) , antiderivative size = 1137, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.424$, Rules

used = {4861, 4859, 4857, 3399, 4269, 3798, 2221, 2317, 2438, 3404, 2296, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \frac{2i\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)b^2}{d(cf+g)\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)b^2}{d(cf-g)\sqrt{d-c^2dx^2}} + \frac{2ig^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b^2}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2ig^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b^2}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)b}{d(cf+g)\sqrt{d-c^2dx^2}} + \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)b}{d(cf-g)\sqrt{d-c^2dx^2}} + \frac{2g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)b}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)b}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] ((-1/2*I)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*(c*f - g)*Sqrt[d - c^
2*d*x^2]) + ((I/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*(c*f + g)*Sq
rt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + Ar
cSin[c*x]/2])/(2*d*(c*f - g)*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(d*(c*f + g)*Sqrt[d - c^2
*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin
```

```
[c*x])])/(d*(c*f - g)*Sqrt[d - c^2*d*x^2]) + (I*g^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2]
)])/(d*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) - (I*g^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])])/(d*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[
1 - c^2*x^2]*PolyLog[2, I/E^(I*ArcSin[c*x])])/(d*(c*f + g)*Sqrt[d - c^2*d*x
^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*(c*
f - g)*Sqrt[d - c^2*d*x^2]) + (2*b*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(d*(c^2*
f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) - (2*b*g^2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
)/(d*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*g^2*Sqrt[1 - c
^2*x^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(d
*(c^2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*g^2*Sqrt[1 - c^2*x
^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(d*(c^
2*f^2 - g^2)^(3/2)*Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(2*d*(c*f + g)*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
```

```
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int\frac{(a+b\arcsin(cx))^2}{(f+gx)(1-c^2x^2)^{3/2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int\left(-\frac{c(a+b\arcsin(cx))^2}{2(cf+g)(-1+cx)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))^2}{2(cf-g)(1+cx)\sqrt{1-c^2x^2}}+\frac{g^2(a+b\arcsin(cx))^2}{(-cf+g)(cf+g)(f+gx)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{2d(cf-g)\sqrt{d-c^2dx^2}}-\frac{\left(c\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{2d(cf+g)\sqrt{d-c^2dx^2}} + \frac{\left(g^2\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{1-c^2x^2}}\,dx}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}$$

$$= \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}$$
$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{4d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2ce^{ix}f+ig-ie^{2ix}g}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{d-c^2dx^2}}$$
$$= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{d(cf-g)\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{d(cf+g)\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(2ig^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g-2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2ig^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{2cf-2ie^{ix}g+2\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

$$- \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}$$

$$+ \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}$$

$$- \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}}$$

$$+ \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{d(cf-g)\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{d(cf+g)\sqrt{d-c^2dx^2}}$$

$$+ \frac{\left(2ibg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$- \frac{\left(2ibg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&- \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&+ \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)dx,x,\arcsin(cx)\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{-ix}\right)dx,x,\arcsin(cx)\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2b^2g^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf-2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b^2g^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{2ie^{ix}g}{2cf+2\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2ib^2g^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\mathrm{PolyLog}\left(2,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2g^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\mathrm{PolyLog}\left(2,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d(-cf+g)(cf+g)\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2g^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2g^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (warning: unable to verify)

Time = 3.81 (sec) , antiderivative size = 597, normalized size of antiderivative = 0.53

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{-((a+b\arcsin(cx))(-ia+a\cot(\frac{1}{4}(\pi+2\arcsin(cx)))+b\arcsin(cx)(-i+\cot(\frac{1}{4}(\pi+2\arcsin}{cf-g}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*((-I)*a + a*Cot[(Pi + 2*ArcSin[c
*x])/4] + b*ArcSin[c*x]*(-I + Cot[(Pi + 2*ArcSin[c*x])/4]) - 4*b*Log[1 + I/
E^(I*ArcSin[c*x])])) + (4*I)*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])/(c*f -
 g) + ((2*I)*g^2*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(
c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin
[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLo
g[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*
ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])
] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] -
 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/((
c*f - g)*(c*f + g)*Sqrt[c^2*f^2 - g^2]) + ((-4*I)*b^2*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])] + (a + b*ArcSin[c*x])*((-I)*a + 4*b*Log[1 + I*E^(I*ArcSin[c*x
])] + a*Tan[(Pi + 2*ArcSin[c*x])/4] + b*ArcSin[c*x]*(-I + Tan[(Pi + 2*ArcSi
n[c*x])/4])))/(c*f + g)))/(2*d*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="fr
icas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*g*x^5 + c^4*d^2*f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2*g
*x + d^2*f), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}(f+gx)}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)),
x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="ma
xima")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="gi
ac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(f+g\,x\right)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)
```

3.79 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1589

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{i(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{i(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}}+\frac{i(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{i(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b^2(cf-g)^3\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{ib^2(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{ib^2(cf+g)^3\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{ib^2(cf-g)^3\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{ib^2(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b^2(cf+g)^3\sqrt{1-c^2x^2}\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$

```
[Out] -1/3*I*b^2*(c*f-g)^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(
1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/4*I*(c*f-g)^2*(c*f+2*g)*(a+b*arcsin(c*x
))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-I*b^2*(c*f-g)^2*(c*f+2
*g)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^
2*d*x^2+d)^(1/2)+1/12*I*(c*f+g)^3*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^
4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b^2*(c*f-g)^3*cot(1/4*Pi+1/2*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*(c*f-g)^3*(a+b*arcsin(c*
x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)
^(1/2)-1/4*(c*f-g)^2*(c*f+2*g)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*
x))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*(c*f-g)^3*(a+b*a
rcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*
d*x^2+d)^(1/2)-1/24*(c*f-g)^3*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x
))*csc(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^
(1/2)+b*(c*f-2*g)*(c*f+g)^2*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1
/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f+g)^3*(a+b*
arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/
(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)^3*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*
x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+b*(c*f-g)^2*
(c*f+2*g)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)
^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+I*b^2*(c*f-2*g)*(c*f+g)^2*polylog(2,I/(
I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+
1/3*I*b^2*(c*f+g)^3*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1
/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/4*I*(c*f-2*g)*(c*f+g)^2*(a+b*arcsin(c*x)
)^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*I*(c*f-g)^3*(a+b*a
rcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*(c*f+g
)^3*(a+b*arcsin(c*x))*sec(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/
d^2/(-c^2*d*x^2+d)^(1/2)+1/6*b^2*(c*f+g)^3*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/
2*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/4*(c*f-2*g)*(c*f+g)^2*(a+b*ar
csin(c*x))^2*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*arcsin(c*x))/c^4/d^2/(-c^2*d
*x^2+d)^(1/2)+1/12*(c*f+g)^3*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*tan(1/4
*Pi+1/2*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/24*(c*f+g)^3*(a+b*arcsi
n(c*x))^2*sec(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*tan(1/4*Pi+1/2*a
rcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 1.39 (sec) , antiderivative size = 1589, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules

used = {4861, 4859, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2(cf-g)^3}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{24c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b^2\sqrt{1-c^2x^2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{6c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)(cf-g)^3}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(cf-g)^3}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{i(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2(cf-g)^2}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^2}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)(cf-g)^2}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{ib^2(cf+2g)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(cf-g)^2}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{i(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{12c^4d^2\sqrt{d-c^2dx^2}}+\frac{i(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{ib^2(cf+g)^3\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{ib^2(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{12c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{4c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{24c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b^2(cf+g)^3\sqrt{1-c^2x^2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{\cdots}$$

```
[In] Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] ((-1/12*I)*(c*f - g)^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sq
rt[d - c^2*d*x^2]) + ((I/4)*(c*f - 2*g)*(c*f + g)^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + ((I/12)*(c*f + g)^3*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^2*d*x^2]) - ((I/4)*
(c*f - g)^2*(c*f + 2*g)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2*S
qrt[d - c^2*d*x^2]) - (b^2*(c*f - g)^3*Sqrt[1 - c^2*x^2]*Cot[Pi/4 + ArcSin[
c*x]/2])/(6*c^4*d^2*Sqrt[d - c^2*d*x^2]) - ((c*f - g)^3*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(12*c^4*d^2*Sqrt[d - c^2*d*
x^2]) - ((c*f - g)^2*(c*f + 2*g)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Co
t[Pi/4 + ArcSin[c*x]/2])/(4*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*(c*f - g)^3*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(12*c^4*d
^2*Sqrt[d - c^2*d*x^2]) - ((c*f - g)^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*c^4*d^2*Sqrt
[d - c^2*d*x^2]) + (b*(c*f - 2*g)*(c*f + g)^2*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (b*(
c*f + g)^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x]
)])/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) + (b*(c*f - g)^3*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c^4*d^2*Sqrt[d - c^2*d*x^2
]) + (b*(c*f - g)^2*(c*f + 2*g)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1
 - I*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (I*b^2*(c*f - 2*g)
*(c*f + g)^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c^4*d^2*Sq
rt[d - c^2*d*x^2]) + ((I/3)*b^2*(c*f + g)^3*Sqrt[1 - c^2*x^2]*PolyLog[2, I/
E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) - ((I/3)*b^2*(c*f - g)^3*
Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*
x^2]) - (I*b^2*(c*f - g)^2*(c*f + 2*g)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*
ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*(c*f + g)^3*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(12*c^4*d^2*Sqrt[d -
c^2*d*x^2]) + (b^2*(c*f + g)^3*Sqrt[1 - c^2*x^2]*Tan[Pi/4 + ArcSin[c*x]/2])
/(6*c^4*d^2*Sqrt[d - c^2*d*x^2]) + ((c*f - 2*g)*(c*f + g)^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(4*c^4*d^2*Sqrt[d - c^2
*d*x^2]) + ((c*f + g)^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*Tan[Pi/4 +
ArcSin[c*x]/2])/(12*c^4*d^2*Sqrt[d - c^2*d*x^2]) + ((c*f + g)^3*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[
c*x]/2])/(24*c^4*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
```

```
1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int\frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\sqrt{1-c^2x^2}\int\left(\frac{(cf+g)^3(a+b\arcsin(cx))^2}{4c^3(-1+cx)^2\sqrt{1-c^2x^2}} - \frac{(cf-2g)(cf+g)^2(a+b\arcsin(cx))^2}{4c^3(-1+cx)\sqrt{1-c^2x^2}} + \frac{(cf-g)^3(a+b\arcsin(cx))^2}{4c^3(1+cx)^2\sqrt{1-c^2x^2}} + \frac{(cf-g)^2(cf+}{4c^3(1-}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left((cf-g)^3\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{4c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left((cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{4c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf+g)^3\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{4c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{4c^3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left((cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{(c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{4c^2d^2\sqrt{d-c^2dx^2}} - \frac{\left((cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{4c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{(-c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{4c^2d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{4c^3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{\left((cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\csc^4\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{16c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{8c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\csc^4\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{16c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left((cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{8c^4d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left((cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b^2(cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left((cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b^2(cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c^4d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{i(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{i(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(b(cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b^2(cf-g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b(cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(b^2(cf+g)^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(b(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{i(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{i(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{i(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{i(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b^2(cf+g)^3\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b^2(cf-g)^3\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{6c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{(cf-g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(cf+g)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(b(cf-g)^3\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b^2(cf-2g)(cf+g)^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\log\left(1-ie^{-ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b(cf+g)^3\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b^2(cf-g)^2(cf+2g)\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$= \text{Too large to display}$

Mathematica [A] (verified)

Time = 6.26 (sec) , antiderivative size = 715, normalized size of antiderivative = 0.45

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{(cf-g)^2(cf+2g)\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin}\right.\right.\right.\right.}{}\right.}{}$$

```
[In] Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(((c*f - g)^2*(c*f + 2*g)*(I*b*((a + b*ArcSin[c*x])^2/b
- 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*Poly
Log[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4
- ArcSin[c*x]/2]))/(4*c^4) - ((c*f - g)^3*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4
 - ArcSin[c*x]/2]^2 + 4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[c*x])
^2*Sec[Pi/4 - ArcSin[c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a + b*A
rcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[
c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c
*x])^2*Tan[Pi/4 - ArcSin[c*x]/2])))/(24*c^4) - ((c*f - 2*g)*(c*f + g)^2*(I*
b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi
+ 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a +
 b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4*c^4) - ((c*f + g)^3*(2*b*(
a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b^2*Tan[Pi/4 + ArcSin[c*
x]/2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin
[c*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1
 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[
c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])))/(24*c^4)))/(
d^2*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 13139 vs. 2(1473) = 2946.

Time = 1.40 (sec) , antiderivative size = 13140, normalized size of antiderivative = 8.27

method	result	size
default	Expression too large to display	13140
parts	Expression too large to display	13140

```
[In] int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERB
OSE)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b*
g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^3}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2),
 x)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*a*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5
/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^3*(2*x/(sqrt(-c^2*d*x^2 +
d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^3*(2*x/(sqr
t(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a^2*g^3*(3*x^2
/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - a^2*f
*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))
+ sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f
^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 + 3*a*b*f
*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^4
*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2*f^2
*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.80 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1025

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}$$
$$+\frac{f^2x(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}+\frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}$$
$$-\frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}}+\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$
$$-\frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2f^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$
$$+\frac{ib^2g^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 2/3*b^2*f*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f^2*x/d^2/(-c^2*d*x^2+d)^(
1/2)+1/3*b^2*g^2*x/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*f^2*x*(a+b*arcsin(c*x))
^2/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*f*g*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^2+1
)/(-c^2*d*x^2+d)^(1/2)+1/3*f^2*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)/(-c^2
*d*x^2+d)^(1/2)+1/3*g^2*x^3*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^
2+d)^(1/2)-1/3*b*f^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2
+d)^(1/2)-2/3*b*f*g*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^
2+d)^(1/2)-1/3*b*g^2*x^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)-1/3*b^2*g^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^
2+d)^(1/2)-2/3*I*f^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x
```

```
^2+d)^(1/2)-2/3*I*b^2*f*g*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^
2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*I*b*f*g*(a+b*arcsin(c*x))*arcta
n(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)
+4/3*b*f^2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1
)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*b*g^2*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*
I*g^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+2
/3*I*b^2*f*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2
/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^2*f^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2
))^2)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*g^2*polylog(2
,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(
1/2)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 1025, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.545$, Rules used = {4861, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267, 4771, 4791, 294, 222}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{g^2(a+b\arcsin(cx))^2x^3}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{bg^2(a+b\arcsin(cx))x^2}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f^2(a+b\arcsin(cx))^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{f^2(a+b\arcsin(cx))^2x}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{2bfg(a+b\arcsin(cx))x}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{2ib^2fg\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{2ib^2fg\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{2ib^2f^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ib^2g^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (2*b^2*f*g)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) + (b^2*f^2*x)/(3*d^2*Sqrt[d - c
^2*d*x^2]) + (b^2*g^2*x)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*g^2*Sqrt[1
- c^2*x^2]*ArcSin[c*x])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*f^2*(a + b*Arc
Sin[c*x]))/(3*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (2*b*f*g*x*(a
+ b*ArcSin[c*x]))/(3*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (b*g^2*
x^2*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) +
(2*f^2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) + (2*f*g*(a + b
*ArcSin[c*x])^2)/(3*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) + (f^2*x*(a
+ b*ArcSin[c*x])^2)/(3*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) + (g^2*x^3*(a
 + b*ArcSin[c*x])^2)/(3*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)
```

```
*f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*x^2]) +
 ((I/3)*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d^2*Sqrt[d - c^2*
d*x^2]) + (((4*I)/3)*b*f*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(
I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) + (4*b*f^2*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*d^2*Sqrt[d - c^2*
d*x^2]) - (2*b*g^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*A
rcSin[c*x])])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*f*g*Sqrt[1 -
 c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2])
 + (((2*I)/3)*b^2*f*g*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c
^2*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*f^2*Sqrt[1 - c^2*x^2]*PolyLog[
2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2]) + ((I/3)*b^2*g^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{2fgx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{g^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}+\frac{\left(2fg\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(g^2\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{f^2x(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2f^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(2bcf^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(4bfg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}-\frac{\left(2bcg^2\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\
&\quad-\frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{f^2x(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\
&\quad+\frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{\left(b^2f^2\sqrt{1-c^2x^2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(4bcf^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2b^2fg\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(2bfg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(b^2g^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}+\frac{\left(2bg^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{f^2x(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(4bf^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(2bfg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2bg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(b^2g^2\sqrt{1-c^2x^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{f^2x(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(8ibf^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2b^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(2b^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(4ibg^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&+ \frac{f^2x(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&- \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(4b^2f^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2ib^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2ib^2fg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2b^2g^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{f^2x(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2f^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ib^2g^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&\quad + \frac{f^2x(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2fg\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2fg\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2f^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ib^2g^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 6.27 (sec) , antiderivative size = 711, normalized size of antiderivative = 0.69

$$
\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{(c^2f^2-g^2)\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin(cx))}\right)\right.\right.\right.}{}\right.}{}
$$

[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]

[Out] (Sqrt[1 - c^2*x^2]*(((c^2*f^2 - g^2)*(I*b*((a + b*ArcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 - ArcSin

```
[c*x]/2]))/(4*c^3) - ((c*f - g)^2*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 - ArcSi
n[c*x]/2]^2 + 4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[c*x])^2*Sec[P
i/4 - ArcSin[c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a + b*ArcSin[c*
x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))]
- b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*T
an[Pi/4 - ArcSin[c*x]/2])))/(24*c^3) - ((c^2*f^2 - g^2)*(I*b*((a + b*ArcSin
[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x])
)] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^
2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4*c^3) - ((c*f + g)^2*(2*b*(a + b*ArcSin[c*x
])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b^2*Tan[Pi/4 + ArcSin[c*x]/2] - (a + b*A
rcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2] + 2*(I*
b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi
+ 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a +
 b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])))/(24*c^3)))/(d^2*Sqrt[d - c^2
*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 9719 vs. 2(974) = 1948.

Time = 1.24 (sec) , antiderivative size = 9720, normalized size of antiderivative = 9.48

method	result	size
default	Expression too large to display	9720
parts	Expression too large to display	9720

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERB
OSE)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin(
c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d
^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2),
 x)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
maxima")
[Out] 1/3*a*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5
/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^2*(2*x/(sqrt(-c^2*d*x^2 +
d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^2*(2*x/(sqr
t(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a^2*g^2*(x/(sq
rt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + sqrt(d)*i
ntegrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x + 1)*sqrt(
-c*x + 1)), x) + 2/3*a^2*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="
giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.81 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 641

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2g}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2fx}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\
&+\frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\
&+\frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}-\frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}}\\
&+\frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}\\
&+\frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}\\
&-\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}\\
&+\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2ib^2f\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*b^2*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f*x/d^2/(-c^2*d*x^2+d)^(1/2)
+2/3*f*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*g*(a+b*arcsin(c*x
))^2/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/3*f*x*(a+b*arcsin(c*x))^2/
d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/3*b*f*(a+b*arcsin(c*x))/c/d^2/(-c^2
*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*b*g*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*
```

```
x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*f*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^
(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*I*b*g*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*f*
(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d
^2/(-c^2*d*x^2+d)^(1/2)-1/3*I*b^2*g*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*g*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-
2/3*I*b^2*f*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d
^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 641, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.452$, Rules used = {4861, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267}

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = {} & \frac{2ibg\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} \\ & -\frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\ & +\frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{4bf\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3cd^2\sqrt{d-c^2dx^2}} \\ & -\frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\ & -\frac{2ib^2f\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}-\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\ & +\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2fx}{3d^2\sqrt{d-c^2dx^2}}+\frac{b^2g}{3c^2d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]

[Out] (b^2*g)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) + (b^2*f*x)/(3*d^2*Sqrt[d - c^2*d*x
^2]) - (b*f*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2]) - (b*g*x*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2
*d*x^2]) + (2*f*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) + (g*(
a + b*ArcSin[c*x])^2)/(3*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) + (f*x*
(a + b*ArcSin[c*x])^2)/(3*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]) - (((2*I)/
3)*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*x^2]) +
 (((2*I)/3)*b*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*
x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) + (4*b*f*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*d^2*Sqrt[d - c^2*d*x^2]) - ((I
/3)*b^2*g*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sq
rt[d - c^2*d*x^2]) + ((I/3)*b^2*g*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSi
```

```
n[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*f*Sqrt[1 - c^2*x^2
]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4861

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Dist[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p], Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[
{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Integer
Q[p - 1/2] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}+\frac{\left(g\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&= \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2f\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2bcf\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(2bg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}+\frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(b^2f\sqrt{1-c^2x^2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(4bcf\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(b^2g\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(bg\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{b^2 g}{3c^2 d^2 \sqrt{d-c^2 d x^2}} + \frac{b^2 f x}{3d^2 \sqrt{d-c^2 d x^2}} - \frac{b f (a+b\arcsin(cx))}{3cd^2 \sqrt{1-c^2x^2}\sqrt{d-c^2 d x^2}} \\
&\quad - \frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(4bf\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(bg\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2 g}{3c^2 d^2 \sqrt{d-c^2 d x^2}} + \frac{b^2 f x}{3d^2 \sqrt{d-c^2 d x^2}} - \frac{b f (a+b\arcsin(cx))}{3cd^2 \sqrt{1-c^2x^2}\sqrt{d-c^2 d x^2}} \\
&\quad - \frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(8ibf\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2 g}{3c^2 d^2 \sqrt{d-c^2dx^2}} + \frac{b^2 f x}{3d^2 \sqrt{d-c^2dx^2}} - \frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&- \frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\
&+ \frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(4b^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(ib^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(ib^2g\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2 g}{3c^2 d^2 \sqrt{d-c^2dx^2}} + \frac{b^2 f x}{3d^2 \sqrt{d-c^2dx^2}} - \frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&- \frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\
&+ \frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2ib^2f\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2 g}{3c^2 d^2 \sqrt{d-c^2dx^2}} + \frac{b^2 fx}{3d^2\sqrt{d-c^2dx^2}} - \frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$- \frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$
$$- \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2ib^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 6.23 (sec) , antiderivative size = 683, normalized size of antiderivative = 1.07

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{f\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin(cx))}\right)-b\,\text{PolyL}\right.\right.\right.}{4c}\right.}{}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*((f*(I*b*((a + b*ArcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[c
*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi -
 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 - ArcSin[c*x]/2]))/(4*
c) - ((c*f - g)*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 - ArcSin[c*x]/2]^2 + 4*b^
2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[c*x])^2*Sec[Pi/4 - ArcSin[c*x]/
2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a + b*ArcSin[c*x])^2/b - 4*(I*(a
+ b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog[2, -E^
((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 - ArcSin[c
*x]/2])))/(24*c^2) - (f*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[
c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi
+ 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4
*c) - ((c*f + g)*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b
^2*Tan[Pi/4 + ArcSin[c*x]/2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]
```

```
/2]^2*Tan[Pi/4 + ArcSin[c*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a
 + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E
^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[
c*x]/2]))/(24*c^2)))/(d^2*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5893 vs. 2(610) = 1220.

Time = 1.25 (sec) , antiderivative size = 5894, normalized size of antiderivative = 9.20

method	result	size
default	Expression too large to display	5894
parts	Expression too large to display	5894

```
[In] int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOS
E)
```

```
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(
c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*
c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})^2\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="ma
xima")
```

```
[Out] 1/3*a*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2
)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)*d
^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f*(2*x/(sqrt(-c^2
*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + sqrt(d)*integrate((2*a*b
*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g*x + b^2*f)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)
*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/3*a^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*
d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="gi
ac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.82 $\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\operatorname{Int}\left(\frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

```
[In] Int[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
[Out] Defer[Int][((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Rubi steps

$$\text{integral}=\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

```
[In] Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
[Out] Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 7.07 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{(a+b\arcsin\left(cx\right))^n\ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

```
[In] int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
[Out] int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.34

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)^n\log\left((gx+f)^mh\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori
thm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/(c^2*
x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))**n*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 1.93 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^n\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori
thm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Giac [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^n\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori
thm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\,{\left(f+g\,x\right)}^m\right)\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^n}{\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2),x)
[Out] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2), x)
```

3.83 $\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 634

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx\\
&=\frac{im(a+b\arcsin(cx))^5}{20b^2c}-\frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc}\\
&\quad-\frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc}+\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}\\
&\quad+\frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad+\frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad-\frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad-\frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad-\frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad-\frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&\quad+\frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}+\frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}$$

```
[Out] 1/20*I*m*(a+b*arcsin(c*x))^5/b^2/c+1/4*(a+b*arcsin(c*x))^4*ln(h*(g*x+f)^m)/
b/c-1/4*m*(a+b*arcsin(c*x))^4*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2
*f^2-g^2)^(1/2)))/b/c-1/4*m*(a+b*arcsin(c*x))^4*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))^3*polylog(2,I
*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*arcsin(
c*x))^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))
/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-
(c^2*f^2-g^2)^(1/2)))/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*x+(-c^2*
x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-6*I*b^2*m*(a+b*arcsin(c*x))*po
lylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-6*I*b^2
*m*(a+b*arcsin(c*x))*polylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2
-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*
f^2-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c
^2*f^2-g^2)^(1/2)))/c
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 634, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.257$, Rules used

$= \{4737, 4863, 4825, 4615, 2221, 2611, 6744, 2320, 6724\}$

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$$
$$= -\frac{6ib^2m(a+b\arcsin(cx))\,\text{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{6ib^2m(a+b\arcsin(cx))\,\text{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))^5}{20b^2c} + \frac{im(a+b\arcsin(cx))^3\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))^3\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{3bm(a+b\arcsin(cx))^2\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{3bm(a+b\arcsin(cx))^2\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{4bc} + \frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc} + \frac{6b^3m\,\text{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{6b^3m\,\text{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[In] Int[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

```
[Out] ((I/20)*m*(a + b*ArcSin[c*x])^5)/(b^2*c) - (m*(a + b*ArcSin[c*x])^4*Log[1 -
 (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(4*b*c) - (m*(a + b*
ArcSin[c*x])^4*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
)/(4*b*c) + ((a + b*ArcSin[c*x])^4*Log[h*(f + g*x)^m])/(4*b*c) + (I*m*(a +
b*ArcSin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/c + (I*m*(a + b*ArcSin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])])/c - (3*b*m*(a + b*ArcSin[c*x])^2*PolyLog[3, (I*
E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/c - (3*b*m*(a + b*ArcSin
[c*x])^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c
 - ((6*I)*b^2*m*(a + b*ArcSin[c*x])*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])])/c - ((6*I)*b^2*m*(a + b*ArcSin[c*x])*PolyLog[4, (
I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c + (6*b^3*m*PolyLog[5
, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/c + (6*b^3*m*PolyLo
g[5, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4863

```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[g*(m/(b*c*Sqr
t[d]*(n + 1))), Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ[
{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[n
, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}-\frac{(gm)\int\frac{(a+b\arcsin(cx))^4}{f+gx}\,dx}{4bc}\\
&= \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}-\frac{(gm)\text{Subst}\left(\int\frac{(a+bx)^4\cos(x)}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{4bc}\\
&= \frac{im(a+b\arcsin(cx))^5}{20b^2c}+\frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}\\
&\quad-\frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^4}{cf-ie^{ix}g-\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{4bc}\\
&\quad-\frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^4}{cf-ie^{ix}g+\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{4bc}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad + \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc} \\
&\quad + \frac{m\text{Subst}\left(\int(a+bx)^3\log\left(1-\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c} \\
&\quad + \frac{m\text{Subst}\left(\int(a+bx)^3\log\left(1-\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad + \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{(3ibm)\text{Subst}\left(\int(a+bx)^2\operatorname{PolyLog}\left(2,\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c} \\
&\quad - \frac{(3ibm)\text{Subst}\left(\int(a+bx)^2\operatorname{PolyLog}\left(2,\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad + \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{(6b^2m)\operatorname{Subst}\left(\int(a+bx)\operatorname{PolyLog}\left(3,\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c} \\
&\quad + \frac{(6b^2m)\operatorname{Subst}\left(\int(a+bx)\operatorname{PolyLog}\left(3,\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)\,dx,x,\arcsin(cx)\right)}{c}
\end{aligned}
$$

$$= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc}$$
$$- \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc}$$
$$+ \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{(6ib^3m)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(4,\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c}$$
$$+ \frac{(6ib^3m)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(4,\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c}$$

$$= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc}$$
$$- \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc}$$
$$+ \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{(6b^3m)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(4,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c}$$
$$+ \frac{(6b^3m)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(4,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c}$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc} \\
&\quad + \frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}
$$

Mathematica [F]

$$
\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx
$$

```
[In] Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
[Out] Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^3\ln(h(gx+f)^m)}{\sqrt{-c^2x^2+1}}dx$$

[In] int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)

[Out] int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori thm="fricas")

[Out] integral(-(b^3*arcsin(c*x)^3 + 3*a*b^2*arcsin(c*x)^2 + 3*a^2*b*arcsin(c*x) + a^3)*sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^3\log(h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

[In] integrate((a+b*asin(c*x))**3*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**3*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)), x)

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori thm="maxima")

[Out] (b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^3/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + 3*a*b^2*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + 3*a^2*b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c

```
*x + 1)), x)*log(h) + b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1))^3*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 3*a*b^2*c*int
egrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)/(sqrt(
c*x + 1)*sqrt(-c*x + 1)), x) + 3*a^2*b*c*integrate(arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^
3*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^3*arc
tan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)^3\log\left((gx+f)^mh\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori
thm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^3*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\left(f+g\,x\right)^m\right)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^3}{\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2),x)
```

```
[Out] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2), x)
```

3.84 $\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 514

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx
&= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&- \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} + \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{3bc} \\
&+ \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&+ \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&- \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&- \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&- \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}
$$

```
[Out] 1/12*I*m*(a+b*arcsin(c*x))^4/b^2/c+1/3*(a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/
b/c-1/3*m*(a+b*arcsin(c*x))^3*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2
*f^2-g^2)^(1/2)))/b/c-1/3*m*(a+b*arcsin(c*x))^3*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))^2*polylog(2,I
*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*arcsin(
c*x))^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))
```

```
/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c
^2*f^2-g^2)^(1/2)))/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-c^2*x^2+
1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4,I*(I*c*x+(-c^2
*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4,I*(I*c*x+
(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 514, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.257$, Rules used = {4737, 4863, 4825, 4615, 2221, 2611, 6744, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$$
$$= \frac{im(a+b\arcsin(cx))^4}{12b^2c}+\frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+\frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$-\frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$-\frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$-\frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc}$$
$$-\frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{3bc}+\frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{3bc}$$
$$-\frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}-\frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[In] Int[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

```
[Out] ((I/12)*m*(a + b*ArcSin[c*x])^4)/(b^2*c) - (m*(a + b*ArcSin[c*x])^3*Log[1 -
 (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(3*b*c) - (m*(a + b*
ArcSin[c*x])^3*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
)/(3*b*c) + ((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/(3*b*c) + (I*m*(a +
b*ArcSin[c*x])^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/c + (I*m*(a + b*ArcSin[c*x])^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])])/c - (2*b*m*(a + b*ArcSin[c*x])*PolyLog[3, (I*E^
(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/c - (2*b*m*(a + b*ArcSin[c
*x])*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c - (
(2*I)*b^2*m*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]
```

```
)/c - ((2*I)*b^2*m*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 -
 g^2])])/c
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
```

```
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4863

```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[g*(m/(b*c*Sqr
t[d]*(n + 1))), Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ[
{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[n
, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{(gm)\int\frac{(a+b\arcsin(cx))^3}{f+gx}\,dx}{3bc}\\
&= \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{(gm)\text{Subst}\left(\int\frac{(a+bx)^3\cos(x)}{cf+g\sin(x)}\,dx,x,\arcsin(cx)\right)}{3bc}\\
&= \frac{im(a+b\arcsin(cx))^4}{12b^2c}+\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}\\
&\quad-\frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^3}{cf-ie^{ix}g-\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{3bc}\\
&\quad-\frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^3}{cf-ie^{ix}g+\sqrt{c^2f^2-g^2}}\,dx,x,\arcsin(cx)\right)}{3bc}
\end{aligned}$$

$$= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} + \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} + \frac{m\text{Subst}\left(\int (a+bx)^2\log\left(1-\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{c} + \frac{m\text{Subst}\left(\int (a+bx)^2\log\left(1-\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{c}$$

$$= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} + \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} + \frac{im(a+b\arcsin(cx))^2\text{PolyLog}\left(2, \frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))^2\text{PolyLog}\left(2, \frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{(2ibm)\text{Subst}\left(\int (a+bx)\text{PolyLog}\left(2, \frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{c} - \frac{(2ibm)\text{Subst}\left(\int (a+bx)\text{PolyLog}\left(2, \frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)dx, x, \arcsin(cx)\right)}{c}$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&\quad + \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{(2b^2m)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c} \\
&\quad + \frac{(2b^2m)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&\quad + \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{(2ib^2m)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(3,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c} \\
&\quad - \frac{(2ib^2m)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(3,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c}
\end{aligned}
$$

$$= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc}$$
$$- \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc}$$
$$+ \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}$$
$$+ \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

Mathematica [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

```
[In] Integrate[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
[Out] Integrate[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Maple [F]

$$\int \frac{\left(a+b\arcsin\left(cx\right)\right)^{2}\ln\left(h\left(gx+f\right)^{m}\right)}{\sqrt{-c^{2}x^{2}+1}}dx$$

```
[In] int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
[Out] int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2\log\left(\left(gx+f\right)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori thm="fricas")

[Out] integral(-sqrt(-c^2*x^2 + 1)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2\log\left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}\,dx$$

[In] integrate((a+b*asin(c*x))**2*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**2*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)), x)

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2\log\left(\left(gx+f\right)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori thm="maxima")

[Out] (b^2*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + b^2*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2*arctan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)^2\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algori
thm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\left(f+g\,x\right)^m\right)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2),x)
```

```
[Out] int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2), x)
```

3.85 $\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 390

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[Out] 1/6*I*m*(a+b*arcsin(c*x))^3/b^2/c+1/2*(a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/b
/c-1/2*m*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*
f^2-g^2)^(1/2)))/b/c-1/2*m*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*arcsin(c*x
))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-b*
```

```
m*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-b*m
*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {4737, 4863, 4825, 4615, 2221, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \frac{im(a+b\arcsin(cx))^3}{6b^2c} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{2bc} - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[In] Int[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

```
[Out] ((I/6)*m*(a + b*ArcSin[c*x])^3)/(b^2*c) - (m*(a + b*ArcSin[c*x])^2*Log[1 -
(I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(2*b*c) - (m*(a + b*A
rcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])
/(2*b*c) + ((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/(2*b*c) + (I*m*(a + b
*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2]
)])/c + (I*m*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/c - (b*m*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - S
qrt[c^2*f^2 - g^2])])/c - (b*m*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])])/c
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4863

```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Dist[g*(m/(b*c*Sqr
```

```
t[d]*(n + 1))), Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ[
{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[n
, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} - \frac{(gm)\int\frac{(a+b\arcsin(cx))^2}{f+gx}\,dx}{2bc}$$

$$= \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} - \frac{(gm)\text{Subst}\left(\int\frac{(a+bx)^2\cos(x)}{cf+g\sin(x)}\,dx, x, \arcsin(cx)\right)}{2bc}$$

$$= \frac{im(a+b\arcsin(cx))^3}{6b^2c} + \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} - \frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^2}{cf-ie^{ix}g-\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{2bc} - \frac{(gm)\text{Subst}\left(\int\frac{e^{ix}(a+bx)^2}{cf-ie^{ix}g+\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right)}{2bc}$$

$$= \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} + \frac{m\text{Subst}\left(\int(a+bx)\log\left(1-\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{c} + \frac{m\text{Subst}\left(\int(a+bx)\log\left(1-\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{c}$$

$$= \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{2bc} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{(ibm)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{ie^{ix}g}{cf-\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c} - \frac{(ibm)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{ie^{ix}g}{cf+\sqrt{c^2f^2-g^2}}\right)dx,x,\arcsin(cx)\right)}{c}$$

$$= \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{2bc} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{(bm)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{igx}{cf-\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c} - \frac{(bm)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{igx}{cf+\sqrt{c^2f^2-g^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c}$$

$$= \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{2bc} + \frac{im(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2724 vs. $2(390) = 780$.

Time = 10.46 (sec) , antiderivative size = 2724, normalized size of antiderivative = 6.98

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \text{Result too large to show}$$

```
[In] Integrate[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (m*ArcSin[c*x]*(2*a + b*ArcSin[c*x])*Log[f + g*x])/(2*c) + (a*ArcSin[c*x]*(
-(m*Log[f + g*x]) + Log[h*(f + g*x)^m]))/c + (b*f*(-(m*Log[f + g*x]) + Log[
h*(f + g*x)^m])*((-I)*ArcSin[c*x]*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f)
+ Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])]) - PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2
 - g^2])] + PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
))/Sqrt[c^2*f^2 - g^2] + (a*g*m*(-1/2*(((3*I)/2)*Pi*ArcSin[c*x] - (I/2)*Arc
Sin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Log[1 + I*E^(I*ArcSin[
c*x])] + 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c
*x]/2]] + Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c*(-c^(-1) - f/g)*g) + ((I/2)*Pi*ArcSin[c*x] - (I/2)*ArcSi
n[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + Pi*Log[1 - I*E^(I*ArcSin[c*
x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c*x
]/2]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, I*E^(I*ArcSi
n[c*x])])/(2*c*(c^(-1) - f/g)*g) + (((-1/2*I)*ArcSin[c*x]^2)/g + (ArcSin[c*
x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + (ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (I
*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])])/g -
```

(I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g)/(c^2*(-c^(-1) - f/g)*(c^(-1) - f/g))))/c - a*c*g*m*(-1/2*(((3*I)/2)*Pi*ArcSin[c*x] - (I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c*x]/2]] + Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*(-c^(-1) - f/g)*g) + ((I/2)*Pi*ArcSin[c*x] - (I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c*x]/2]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(2*c^3*(c^(-1) - f/g)*g) + (f^2*(((-1/2*I)*ArcSin[c*x]^2)/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (I*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])])/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g))/(c^2*(-c^(-1) - f/g)*(c^(-1) - f/g)*g^2)) + (b*(-(m*Log[f + g*x]) + Log[h*(f + g*x)^m])*(ArcSin[c*x]^2 - 2*c*f*((Pi*ArcTan[(g + c*f*Tan[ArcSin[c*x]/2])/Sqrt[c^2*f^2 - g^2]])/Sqrt[c^2*f^2 - g^2] + (2*ArcCos[-((c*f)/g)]*ArcTanh[((c*f - g)*Cot[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]] + (Pi - 2*ArcSin[c*x])*ArcTanh[((c*f + g)*Tan[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]] + (ArcCos[-((c*f)/g)] + (2*I)*(ArcTanh[((c*f - g)*Cot[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]] + ArcTanh[((c*f + g)*Tan[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]]))*Log[((1/2 + I/2)*Sqrt[-(c^2*f^2) + g^2])/(E^((I/2)*ArcSin[c*x])*Sqrt[g]*Sqrt[c*f + c*g*x])] + (ArcCos[-((c*f)/g)] - (2*I)*ArcTanh[((c*f - g)*Cot[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]] - (2*I)*ArcTanh[((c*f + g)*Tan[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]])*Log[((1/2 - I/2)*E^((I/2)*ArcSin[c*x])*Sqrt[-(c^2*f^2) + g^2])/(Sqrt[g]*Sqrt[c*f + c*g*x])] - (ArcCos[-((c*f)/g)] + (2*I)*ArcTanh[((c*f - g)*Cot[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]])*Log[((c*f + g)*(-(c*f) + g - I*Sqrt[-(c^2*f^2) + g^2])*(1 + I*Cot[(Pi + 2*ArcSin[c*x])/4]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))] - (ArcCos[-((c*f)/g)] - (2*I)*ArcTanh[((c*f - g)*Cot[(Pi + 2*ArcSin[c*x])/4])/Sqrt[-(c^2*f^2) + g^2]])*Log[((c*f + g)*(I*c*f - I*g + Sqrt[-(c^2*f^2) + g^2])*(I + Cot[(Pi + 2*ArcSin[c*x])/4]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))] + I*(PolyLog[2, ((c*f - I*Sqrt[-(c^2*f^2) + g^2])*(c*f + g - Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))] - PolyLog[2, ((c*f + I*Sqrt[-(c^2*f^2) + g^2])*(c*f + g - Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))/(g*(c*f + g + Sqrt[-(c^2*f^2) + g^2]*Cot[(Pi + 2*ArcSin[c*x])/4]))]))/Sqrt[-(c^2*f^2) + g^2])))/(2*c) - (b*g*m*(((-1/3*I)*ArcSin[c*x]^3)/g + (ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + (ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - ((2*I)*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g - ((2*I)*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g + (2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + (2*P

```
olyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g))/(2*c)
```

Maple [F]

$$\int \frac{(a + b \arcsin(cx)) \ln(h(gx + f)^m)}{\sqrt{-c^2x^2 + 1}} dx$$

```
[In] int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
[Out] int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a + b \arcsin(cx)) \log(h(f + gx)^m)}{\sqrt{1 - c^2x^2}} dx = \int \frac{(b \arcsin(cx) + a) \log((gx + f)^m h)}{\sqrt{-c^2x^2 + 1}} dx$$

```
[In] integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorith
m="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*log((g*x + f)^m*h)/(c^2*x^
2 - 1), x)
```

Sympy [F]

$$\int \frac{(a + b \arcsin(cx)) \log(h(f + gx)^m)}{\sqrt{1 - c^2x^2}} dx = \int \frac{(a + b \operatorname{asin}(cx)) \log(h(f + gx)^m)}{\sqrt{-(cx - 1)(cx + 1)}} dx$$

```
[In] integrate((a+b*asin(c*x))*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
[Out] Integral((a + b*asin(c*x))*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)),
x)
```

Maxima [F]

$$\int \frac{(a + b \arcsin(cx)) \log(h(f + gx)^m)}{\sqrt{1 - c^2x^2}} dx = \int \frac{(b \arcsin(cx) + a) \log((gx + f)^m h)}{\sqrt{-c^2x^2 + 1}} dx$$

```
[In] integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorith
m="maxima")
[Out] (b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sq
rt(-c*x + 1)), x)*log(h) + b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*c*integrat
e(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*arctan2(c*x, sqrt
(-c^2*x^2 + 1))*log(h))/c
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin\left(cx\right)+a)\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

[In] integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorith m="giac")

[Out] integrate((b*arcsin(c*x) + a)*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\ln\left(h\,(f+g\,x)^m\right)\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{1-c^2\,x^2}}\,dx$$

[In] int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2),x)

[Out] int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2), x)

3.86 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[Out] 1/2*I*m*arcsin(c*x)^2/c+arcsin(c*x)*ln(h*(g*x+f)^m)/c-m*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-m*arcsin(c*x)*ln(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c+I*m*polylog(2
,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

$= \{222, 2451, 4825, 4615, 2221, 2317, 2438\}$

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} + \frac{im\arcsin(cx)^2}{2c}$$

```
[In] Int[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
```

```
[Out] ((I/2)*m*ArcSin[c*x]^2)/c - (m*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/
(c*f - Sqrt[c^2*f^2 - g^2])])/c - (m*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x
])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c + (ArcSin[c*x]*Log[h*(f + g*x)^m])/c
+ (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/c +
 (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/c
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} - (gm)\int \frac{\arcsin(cx)}{cf+cgx}\,dx \\
&= \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} - (gm)\text{Subst}\left(\int \frac{x\cos(x)}{c^2f+cg\sin(x)}\,dx, x, \arcsin(cx)\right) \\
&= \frac{im\arcsin(cx)^2}{2c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} \\
&\quad - (gm)\text{Subst}\left(\int \frac{e^{ix}x}{c^2f-ice^{ix}g-c\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right) \\
&\quad - (gm)\text{Subst}\left(\int \frac{e^{ix}x}{c^2f-ice^{ix}g+c\sqrt{c^2f^2-g^2}}\,dx, x, \arcsin(cx)\right) \\
&= \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} \\
&\quad + \frac{m\text{Subst}\left(\int \log\left(1-\frac{ice^{ix}g}{c^2f-c\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{c} \\
&\quad + \frac{m\text{Subst}\left(\int \log\left(1-\frac{ice^{ix}g}{c^2f+c\sqrt{c^2f^2-g^2}}\right)\,dx, x, \arcsin(cx)\right)}{c}
\end{aligned}$$

$$= \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log(h(f+gx)^m)}{c} - \frac{(im)\text{Subst}\left(\int \frac{\log\left(1-\frac{icgx}{c^2f-c\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{c} - \frac{(im)\text{Subst}\left(\int \frac{\log\left(1-\frac{icgx}{c^2f+c\sqrt{c^2f^2-g^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{c}$$

$$= \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log(h(f+gx)^m)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.04

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f-c\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f+c\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log(h(f+gx)^m)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

```
[In] Integrate[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
[Out] ((I/2)*m*ArcSin[c*x]^2)/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*ArcSin[c*x])*g
)/(c^2*f - c*Sqrt[c^2*f^2 - g^2])])/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*Ar
cSin[c*x])*g)/(c^2*f + c*Sqrt[c^2*f^2 - g^2])])/c + (ArcSin[c*x]*Log[h*(f +
 g*x)^m])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 -
 g^2])])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 -
g^2])])/c
```

Maple [F]

$$\int \frac{\ln \left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

```
[In] int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
[Out] int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}\,dx$$

```
[In] integrate(ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Giac [F]

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\ln \left(h\,(f+g\,x)^m\right)}{\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2),x)
[Out] int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2), x)
```

3.87 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\operatorname{Int}\left(\frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 12.39 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{\ln \left(h(gx+f)^m\right)}{\left(a+b\arcsin \left(cx\right)\right)\sqrt{-c^2x^2+1}}dx$$

```
[In] int(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.63

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}(b\arcsin \left(cx\right)+a)}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorith
m="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(a*c^2*x^2 + (b*c^2*x^2 - b
)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 9.44 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.97

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(ln(h*(g*x+f)**m)/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(log(h*(f + g*x)**m)/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)))
, x)
```

Maxima [N/A]

Not integrable

Time = 1.01 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorith
m="maxima")
[Out] integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorith
m="giac")
[Out] integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{\ln\left(h\,{\left(f+g\,x\right)}^m\right)}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.88 $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 351

$$\begin{aligned}
&\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx \\
&= \frac{be(4e^2g+25c^2d(ef+dg))\,x^2\sqrt{1-c^2x^2}}{75c^3}+\frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3gx^4\sqrt{1-c^2x^2}}{25c} \\
&\quad+\frac{b(32(75c^4d^3f+8e^3g+50c^2de(ef+dg))+75c^2(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\,x)\sqrt{1-c^2x^2}}{2400c^5} \\
&\quad-\frac{b(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\arcsin(cx)}{32c^4}+d^3fx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+de(ef+dg)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))
\end{aligned}$$

```
[Out] -1/32*b*(8*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*arcsin(c*x)/c^4+d^3*f*x*(
a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcsin(c*x))+d*e*(d*g+e*f)*x^
3*(a+b*arcsin(c*x))+1/4*e^2*(3*d*g+e*f)*x^4*(a+b*arcsin(c*x))+1/5*e^3*g*x^5
*(a+b*arcsin(c*x))+1/75*b*e*(4*e^2*g+25*c^2*d*(d*g+e*f))*x^2*(-c^2*x^2+1)^(
1/2)/c^3+1/16*b*e^2*(3*d*g+e*f)*x^3*(-c^2*x^2+1)^(1/2)/c+1/25*b*e^3*g*x^4*(
-c^2*x^2+1)^(1/2)/c+1/2400*b*(2400*c^4*d^3*f+256*e^3*g+1600*c^2*d*e*(d*g+e*
f)+75*c^2*(8*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*x)*(-c^2*x^2+1)^(1/2)/c
^5
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4833, 1823, 794, 222}

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx)) + \frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx)) + dex^3(dg+ef)(a+b\arcsin(cx)) + \frac{1}{5}e^3gx^5(a+b\arcsin(cx)) - \frac{b\arcsin(cx)\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)}{32c^4} + \frac{be^2x^3\sqrt{1-c^2x^2}(3dg+ef)}{16c} + \frac{be^3gx^4\sqrt{1-c^2x^2}}{25c} + \frac{bex^2\sqrt{1-c^2x^2}(25c^2d(dg+ef)+4e^2g)}{75c^3} + \frac{b\sqrt{1-c^2x^2}(75c^2x(8c^2d^2(dg+3ef)+3e^2(3dg+ef))+32(75c^4d^3f+50c^2de(dg+ef)+8e^3g))}{2400c^5}$$

```
[In] Int[(d + e*x)^3*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(4*e^2*g + 25*c^2*d*(e*f + d*g))*x^2*Sqrt[1 - c^2*x^2])/(75*c^3) + (b*
e^2*(e*f + 3*d*g)*x^3*Sqrt[1 - c^2*x^2])/(16*c) + (b*e^3*g*x^4*Sqrt[1 - c^2
*x^2])/(25*c) + (b*(32*(75*c^4*d^3*f + 8*e^3*g + 50*c^2*d*e*(e*f + d*g)) +
75*c^2*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*x)*Sqrt[1 - c^2*x^2]
)/(2400*c^5) - (b*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*ArcSin[c*
x])/(32*c^4) + d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*
ArcSin[c*x]))/2 + d*e*(e*f + d*g)*x^3*(a + b*ArcSin[c*x]) + (e^2*(e*f + 3*d
*g)*x^4*(a + b*ArcSin[c*x]))/4 + (e^3*g*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
```

```
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

integral

$$= d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx)) - (bc)\int\frac{x\left(d^3f+\frac{1}{2}d^2(3ef+dg)x+de(ef+dg)x^2+\frac{1}{4}e^2(ef+3dg)x^3+\frac{1}{5}e^3gx^4\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{be^3gx^4\sqrt{1-c^2x^2}}{25c}+d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx)) + \frac{b\int\frac{x\left(-5c^2d^3f-\frac{5}{2}c^2d^2(3ef+dg)x-\frac{1}{5}e\left(4e^2g+25c^2d(ef+dg)\right)x^2-\frac{5}{4}c^2e^2(ef+3dg)x^3\right)}{\sqrt{1-c^2x^2}}\,dx}{5c}$$

$$= \frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3gx^4\sqrt{1-c^2x^2}}{25c}+d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx)) - \frac{b\int\frac{x\left(20c^4d^3f+\frac{5}{4}c^2\left(8c^2d^2(3ef+dg)+3e^2(ef+3dg)\right)x+\frac{4}{5}c^2e\left(4e^2g+25c^2d(ef+dg)\right)x^2\right)}{\sqrt{1-c^2x^2}}\,dx}{20c^3}$$

$$= \frac{be(4e^2g + 25c^2d(ef+dg))\,x^2\sqrt{1-c^2x^2}}{75c^3} + \frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^3gx^4\sqrt{1-c^2x^2}}{25c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^3gx^5(a+b\arcsin(cx)) + \frac{b\int \frac{x\left(-\frac{4}{5}c^2(75c^4d^3f+8e^3g+50c^2de(ef+dg))-\frac{15}{4}c^4(8c^2d^2(3ef+dg)+3e^2(ef+3dg))x\right)}{\sqrt{1-c^2x^2}}dx}{60c^5}$$

$$= \frac{be(4e^2g + 25c^2d(ef+dg))\,x^2\sqrt{1-c^2x^2}}{75c^3} + \frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^3gx^4\sqrt{1-c^2x^2}}{25c} + \frac{b(32(75c^4d^3f+8e^3g+50c^2de(ef+dg))+75c^2(8c^2d^2(3ef+dg)+3e^2(ef+3dg))x)\sqrt{1-c^2x^2}}{2400c^5} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^3gx^5(a+b\arcsin(cx)) - \frac{(b(8c^2d^2(3ef+dg)+3e^2(ef+3dg)))\int\frac{1}{\sqrt{1-c^2x^2}}dx}{32c^3}$$

$$= \frac{be(4e^2g + 25c^2d(ef+dg))\,x^2\sqrt{1-c^2x^2}}{75c^3} + \frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^3gx^4\sqrt{1-c^2x^2}}{25c} + \frac{b(32(75c^4d^3f+8e^3g+50c^2de(ef+dg))+75c^2(8c^2d^2(3ef+dg)+3e^2(ef+3dg))x)\sqrt{1-c^2x^2}}{2400c^5} - \frac{b(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\arcsin(cx)}{32c^4} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + de(ef+dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.87

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \frac{120ac^5x(10d^3(2f+gx)+10d^2ex(3f+2gx)+5de^2x^2(4f+3gx)+e^3x^3(5f+4gx))+b\sqrt{1-c^2x^2}(256e^3g}{}$$

```
[In] Integrate[(d + e*x)^3*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (120*a*c^5*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f + 2*g*x) + 5*d*e^2*x^2*(
4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)) + b*Sqrt[1 - c^2*x^2]*(256*e^3*g + 2*
```

```
c^4*(300*d^3*(4*f + g*x) + 100*d^2*e*x*(9*f + 4*g*x) + 25*d*e^2*x^2*(16*f +
 9*g*x) + 3*e^3*x^3*(25*f + 16*g*x)) + c^2*e*(1600*d^2*g + 25*d*e*(64*f + 2
7*g*x) + e^2*x*(225*f + 128*g*x))) + 15*b*c*(-40*c^2*d^2*(3*e*f + d*g) - 15
*e^2*(e*f + 3*d*g) + 8*c^4*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f + 2*g*x)
 + 5*d*e^2*x^2*(4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)))*ArcSin[c*x])/(2400*c
^5)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.27

method	result
parts	$a\left(\frac{e^3 g x^5}{5}+\frac{(3d e^2 g+e^3 f)x^4}{4}+\frac{(3d^2 e g+3d e^2 f)x^3}{3}+\frac{(d^3 g+3d^2 e f)x^2}{2}+d^3 f x\right)+\frac{b\left(\frac{c\arcsin(cx)e^3 g x^5}{5}+\frac{3c\,\mathrm{arc}\ldots}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{e^3 g c^5 x^5}{5}+\frac{(3dc e^2 g+e^3 c f)c^4 x^4}{4}+\frac{(3d^2 c^2 e g+3d c^2 e^2 f)c^3 x^3}{3}+\frac{(c^3 d^3 g+3d^2 c^3 e f)c^2 x^2}{2}+d^3 c^5 f x\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^3 g c^5 x^5}{5}+\frac{3\,\mathrm{a}\ldots}{}\right.}{}$
default	$\frac{a\left(\frac{e^3 g c^5 x^5}{5}+\frac{(3dc e^2 g+e^3 c f)c^4 x^4}{4}+\frac{(3d^2 c^2 e g+3d c^2 e^2 f)c^3 x^3}{3}+\frac{(c^3 d^3 g+3d^2 c^3 e f)c^2 x^2}{2}+d^3 c^5 f x\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^3 g c^5 x^5}{5}+\frac{3\,\mathrm{a}\ldots}{}\right.}{}$

```
[In] int((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/5*e^3*g*x^5+1/4*(3*d*e^2*g+e^3*f)*x^4+1/3*(3*d^2*e*g+3*d*e^2*f)*x^3+1/
2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/5*c*arcsin(c*x)*e^3*g*x^5+3/4*c*arc
sin(c*x)*x^4*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+c*arcsin(c*x)*x^3*d^2*e*g+
c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*arcsin(c*x)*x^2
*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^4*(12*e^3*g*(-1/5*c^4*x^4*(-c^2*x^2+1
)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-60*d^3*c^4
*f*(-c^2*x^2+1)^(1/2)+3*(15*c*d*e^2*g+5*c*e^3*f)*(-1/4*c^3*x^3*(-c^2*x^2+1)
^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+3*(10*c^3*d^3*g+30*c^3*d
^2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+3*(20*c^2*d^2*e*g+20*
c^2*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.26

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \frac{480\,ac^5e^3gx^5 + 2400\,ac^5d^3fx + 600\,(ac^5e^3f + 3\,ac^5de^2g)x^4 + 2400\,(ac^5de^2f + ac^5d^2eg)x^3 + 1200\,(3\,ac^5d^2e}{}$$

```
[In] integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/2400*(480*a*c^5*e^3*g*x^5 + 2400*a*c^5*d^3*f*x + 600*(a*c^5*e^3*f + 3*a*c
^5*d*e^2*g)*x^4 + 2400*(a*c^5*d*e^2*f + a*c^5*d^2*e*g)*x^3 + 1200*(3*a*c^5*
d^2*e*f + a*c^5*d^3*g)*x^2 + 15*(32*b*c^5*e^3*g*x^5 + 160*b*c^5*d^3*f*x + 4
0*(b*c^5*e^3*f + 3*b*c^5*d*e^2*g)*x^4 + 160*(b*c^5*d*e^2*f + b*c^5*d^2*e*g)
*x^3 + 80*(3*b*c^5*d^2*e*f + b*c^5*d^3*g)*x^2 - 15*(8*b*c^3*d^2*e + b*c*e^3
)*f - 5*(8*b*c^3*d^3 + 9*b*c*d*e^2)*g)*arcsin(c*x) + (96*b*c^4*e^3*g*x^4 +
150*(b*c^4*e^3*f + 3*b*c^4*d*e^2*g)*x^3 + 32*(25*b*c^4*d*e^2*f + (25*b*c^4*
d^2*e + 4*b*c^2*e^3)*g)*x^2 + 800*(3*b*c^4*d^3 + 2*b*c^2*d*e^2)*f + 64*(25*
b*c^2*d^2*e + 4*b*e^3)*g + 75*(3*(8*b*c^4*d^2*e + b*c^2*e^3)*f + (8*b*c^4*d
^3 + 9*b*c^2*d*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 770 vs. 2(338) = 676.

Time = 0.50 (sec) , antiderivative size = 770, normalized size of antiderivative = 2.19

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \begin{cases} ad^3fx + \frac{ad^3gx^2}{2} + \frac{3ad^2efx^2}{2} + ad^2egx^3 + ade^2fx^3 + \frac{3ade^2gx^4}{4} + \frac{ae^3fx^4}{4} + \frac{ae^3gx^5}{5} + bd^3fx\,\mathrm{asin}\,(cx) + \frac{bd^3gx^2\,\mathrm{asin}}{2} \\ a\left(d^3fx + \frac{d^3gx^2}{2} + \frac{3d^2efx^2}{2} + d^2egx^3 + de^2fx^3 + \frac{3de^2gx^4}{4} + \frac{e^3fx^4}{4} + \frac{e^3gx^5}{5}\right) \end{cases}$$

```
[In] integrate((e*x+d)**3*(g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g*
x**3 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + a*e**3*f*x**4/4 + a*e**3*g*x
**5/5 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + 3*b*d**2*e*f*x**
2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(c*x) + b*d*e**2*f*x**3*asin(c*x) + 3*b
*d*e**2*g*x**4*asin(c*x)/4 + b*e**3*f*x**4*asin(c*x)/4 + b*e**3*g*x**5*asin
(c*x)/5 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**2 + 1)
/(4*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*e*g*x**2*sqrt(-
c**2*x**2 + 1)/(3*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e
```

```
**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*f*x**3*sqrt(-c**2*x**2 + 1)
/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**3*g*asin(c*x)/(4
*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**2*e*g*sqrt(-c**2*x**2 + 1
)/(3*c**3) + 2*b*d*e**2*f*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d*e**2*g*x*sq
rt(-c**2*x**2 + 1)/(32*c**3) + 3*b*e**3*f*x*sqrt(-c**2*x**2 + 1)/(32*c**3)
+ 4*b*e**3*g*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 9*b*d*e**2*g*asin(c*x)/(
32*c**4) - 3*b*e**3*f*asin(c*x)/(32*c**4) + 8*b*e**3*g*sqrt(-c**2*x**2 + 1)
/(75*c**5), Ne(c, 0)), (a*(d**3*f*x + d**3*g*x**2/2 + 3*d**2*e*f*x**2/2 + d
**2*e*g*x**3 + d*e**2*f*x**3 + 3*d*e**2*g*x**4/4 + e**3*f*x**4/4 + e**3*g*x
**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.50

$$\begin{aligned}
&\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx \\
&= \frac{1}{5}\,ae^3gx^5 + \frac{1}{4}\,ae^3fx^4 + \frac{3}{4}\,ade^2gx^4 + ade^2fx^3 + ad^2egx^3 + \frac{3}{2}\,ad^2efx^2 \\
&\quad + \frac{1}{2}\,ad^3gx^2 + \frac{3}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2ef \\
&\quad + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2f \\
&\quad + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3f \\
&\quad + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^3g \\
&\quad + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2eg \\
&\quad + \frac{3}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde^2g \\
&\quad + \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3g \\
&\quad + ad^3fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3f}{c}
\end{aligned}$$

```
[In] integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*d
^2*e*g*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^3*arc
sin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e
^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^
2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*x^3*arcsi
n(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*e
*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*
x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5*arcsin(c*x)
 + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c
^2*x^2 + 1)/c^6)*c)*b*e^3*g + a*d^3*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2
+ 1))*b*d^3*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(324) = 648$.

Time = 0.31 (sec) , antiderivative size = 784, normalized size of antiderivative = 2.23

$$
\begin{aligned}
\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx &= \frac{1}{5}\,ae^3gx^5 + \frac{1}{4}\,ae^3fx^4 + \frac{3}{4}\,ade^2gx^4 \\
&+ ade^2fx^3 + ad^2egx^3 + bd^3fx\arcsin(cx) \\
&+ ad^3fx + \frac{(c^2x^2-1)bde^2fx\arcsin(cx)}{c^2} \\
&+ \frac{(c^2x^2-1)bd^2egx\arcsin(cx)}{c^2} \\
&+ \frac{3\sqrt{-c^2x^2+1}bd^2efx}{4\,c} + \frac{\sqrt{-c^2x^2+1}bd^3gx}{4\,c} \\
&+ \frac{3\,(c^2x^2-1)bd^2ef\arcsin(cx)}{2\,c^2} \\
&+ \frac{(c^2x^2-1)bd^3g\arcsin(cx)}{2\,c^2} \\
&+ \frac{bde^2fx\arcsin(cx)}{c^2} + \frac{bd^2egx\arcsin(cx)}{c^2} \\
&+ \frac{(c^2x^2-1)^2be^3gx\arcsin(cx)}{5\,c^4} \\
&+ \frac{\sqrt{-c^2x^2+1}bd^3f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^3fx}{16\,c^3} \\
&- \frac{3\,(-c^2x^2+1)^{\frac{3}{2}}bde^2gx}{16\,c^3} + \frac{3\,(c^2x^2-1)ad^2ef}{2\,c^2} \\
&+ \frac{(c^2x^2-1)ad^3g}{2\,c^2} + \frac{3\,bd^2ef\arcsin(cx)}{4\,c^2} \\
&+ \frac{(c^2x^2-1)^2be^3f\arcsin(cx)}{4\,c^4} + \frac{bd^3g\arcsin(cx)}{4\,c^2} \\
&+ \frac{3\,(c^2x^2-1)^2bde^2g\arcsin(cx)}{4\,c^4} \\
&+ \frac{2\,(c^2x^2-1)be^3gx\arcsin(cx)}{5\,c^4} \\
&- \frac{(-c^2x^2+1)^{\frac{3}{2}}bde^2f}{3\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2eg}{3\,c^3} \\
&+ \frac{5\sqrt{-c^2x^2+1}be^3fx}{32\,c^3} + \frac{15\sqrt{-c^2x^2+1}bde^2gx}{32\,c^3} \\
&+ \frac{(c^2x^2-1)be^3f\arcsin(cx)}{2\,c^4} \\
&+ \frac{3\,(c^2x^2-1)bde^2g\arcsin(cx)}{2\,c^4} \\
&+ \frac{be^3gx\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}bde^2f}{c^3} \\
&+ \frac{\sqrt{-c^2x^2+1}bd^2eg}{c^3} \\
&+ \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^3g}{25\,c^5} \\
&+ \frac{5\,be^3f\arcsin(cx)}{32\,c^4} + \frac{15\,bde^2g\arcsin(cx)}{32\,c^4} \\
&- \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}be^3g}{} + \frac{\sqrt{-c^2x^2+1}be^3g}{}
\end{aligned}
$$

```
[In] integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*d
^2*e*g*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*f*x*
arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2
*x^2 + 1)*b*d^2*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2
 - 1)*b*d^2*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2
 + b*d*e^2*f*x*arcsin(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2
 - 1)^2*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c
^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3
 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*
d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4
*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 +
2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*
e^2*f/c^3 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 + 5/32*sqrt(-c^2*x^2 + 1
)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*g*x/c^3 + 1/2*(c^2*x^2 -
 1)*b*e^3*f*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b*d*e^2*g*arcsin(c*x)/c^4 +
 1/5*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*e^2*f/c^3 + sqrt(-c
^2*x^2 + 1)*b*d^2*e*g/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3*g
/c^5 + 5/32*b*e^3*f*arcsin(c*x)/c^4 + 15/32*b*d*e^2*g*arcsin(c*x)/c^4 - 2/1
5*(-c^2*x^2 + 1)^(3/2)*b*e^3*g/c^5 + 1/5*sqrt(-c^2*x^2 + 1)*b*e^3*g/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^3\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3,x)
```

```
[Out] int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3, x)
```

3.89 $\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 248

$$
\begin{aligned}
\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx
&= \frac{be(ef+2dg)x^2\sqrt{1-c^2x^2}}{9c} + \frac{be^2gx^3\sqrt{1-c^2x^2}}{16c} \\
&\quad + \frac{b(32(9c^2d^2f+2e(ef+2dg))+9(3e^2g+8c^2d(2ef+dg))x)\sqrt{1-c^2x^2}}{288c^3} \\
&\quad - \frac{b(3e^2g+8c^2d(2ef+dg))\arcsin(cx)}{32c^4} \\
&\quad + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2gx^4(a+b\arcsin(cx))
\end{aligned}
$$

```
[Out] -1/32*b*(3*e^2*g+8*c^2*d*(d*g+2*e*f))*arcsin(c*x)/c^4+d^2*f*x*(a+b*arcsin(c
*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*e*(2*d*g+e*f)*x^3*(a+b*arc
sin(c*x))+1/4*e^2*g*x^4*(a+b*arcsin(c*x))+1/9*b*e*(2*d*g+e*f)*x^2*(-c^2*x^2
+1)^(1/2)/c+1/16*b*e^2*g*x^3*(-c^2*x^2+1)^(1/2)/c+1/288*b*(288*c^2*d^2*f+64
*e*(2*d*g+e*f)+9*(3*e^2*g+8*c^2*d*(d*g+2*e*f))*x)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))$$
$$+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$
$$-\frac{b\arcsin(cx)\left(8c^2d(dg+2ef)+3e^2g\right)}{32c^4}+\frac{bex^2\sqrt{1-c^2x^2}(2dg+ef)}{9c}+\frac{be^2gx^3\sqrt{1-c^2x^2}}{16c}$$
$$+\frac{b\sqrt{1-c^2x^2}(32(9c^2d^2f+2e(2dg+ef))+9x(8c^2d(dg+2ef)+3e^2g))}{288c^3}$$

```
[In] Int[(d + e*x)^2*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(e*f + 2*d*g)*x^2*Sqrt[1 - c^2*x^2])/(9*c) + (b*e^2*g*x^3*Sqrt[1 - c^2
*x^2])/(16*c) + (b*(32*(9*c^2*d^2*f + 2*e*(e*f + 2*d*g)) + 9*(3*e^2*g + 8*c
^2*d*(2*e*f + d*g))*x)*Sqrt[1 - c^2*x^2])/(288*c^3) - (b*(3*e^2*g + 8*c^2*d
*(2*e*f + d*g))*ArcSin[c*x])/(32*c^4) + d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2
*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + (e*(e*f + 2*d*g)*x^3*(a + b*ArcSin
[c*x]))/3 + (e^2*g*x^4*(a + b*ArcSin[c*x]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
```

```
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x(12d^2f+6d(2ef+dg)x+4e(ef+2dg)x^2+3e^2gx^3)}{12\sqrt{1-c^2x^2}}\,dx \\
&= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx)) \\
&\quad-\frac{1}{12}(bc)\int\frac{x(12d^2f+6d(2ef+dg)x+4e(ef+2dg)x^2+3e^2gx^3)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{be^2gx^3\sqrt{1-c^2x^2}}{16c}+d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx)) \\
&\quad+\frac{b\int\frac{x(-48c^2d^2f-3(3e^2g+8c^2d(2ef+dg))x-16c^2e(ef+2dg)x^2)}{\sqrt{1-c^2x^2}}\,dx}{48c} \\
&= \frac{be(ef+2dg)x^2\sqrt{1-c^2x^2}}{9c}+\frac{be^2gx^3\sqrt{1-c^2x^2}}{16c}+d^2fx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))-\frac{b\int\frac{x(16c^2(9c^2d^2f+2e(ef+2dg))+9c^2(3e^2g+8c^2d(2ef+dg))x)}{\sqrt{1-c^2x^2}}\,dx}{144c^3}
\end{aligned}$$

$$= \frac{be(ef+2dg)x^2\sqrt{1-c^2x^2}}{9c} + \frac{be^2gx^3\sqrt{1-c^2x^2}}{16c} + \frac{b(32(9c^2d^2f+2e(ef+2dg))+9(3e^2g+8c^2d(2ef+dg))x)\sqrt{1-c^2x^2}}{288c^3} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2gx^4(a+b\arcsin(cx)) - \frac{(b(3e^2g+8c^2d(2ef+dg)))\int\frac{1}{\sqrt{1-c^2x^2}}dx}{32c^3}$$

$$= \frac{be(ef+2dg)x^2\sqrt{1-c^2x^2}}{9c} + \frac{be^2gx^3\sqrt{1-c^2x^2}}{16c} + \frac{b(32(9c^2d^2f+2e(ef+2dg))+9(3e^2g+8c^2d(2ef+dg))x)\sqrt{1-c^2x^2}}{288c^3} - \frac{b(3e^2g+8c^2d(2ef+dg))\arcsin(cx)}{32c^4} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx)) + \frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.85

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$

$$= \frac{24ac^4x(6d^2(2f+gx)+4dex(3f+2gx)+e^2x^2(4f+3gx))+bc\sqrt{1-c^2x^2}(e(64ef+128dg+27egx)+2c^2}{}$$

```
[In] Integrate[(d + e*x)^2*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*a*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*(3*f + 2*g*x) + e^2*x^2*(4*f + 3*g
*x)) + b*c*Sqrt[1 - c^2*x^2]*(e*(64*e*f + 128*d*g + 27*e*g*x) + 2*c^2*(36*d
^2*(4*f + g*x) + 8*d*e*x*(9*f + 4*g*x) + e^2*x^2*(16*f + 9*g*x))) + 3*b*(-9
*e^2*g - 24*c^2*d*(2*e*f + d*g) + 8*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*(3*f
 + 2*g*x) + e^2*x^2*(4*f + 3*g*x)))*ArcSin[c*x])/(288*c^4)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.23

method	result
parts	$a\left(\frac{e^2 g\,x^4}{4}+\frac{(2deg+e^2 f)x^3}{3}+\frac{(d^2 g+2def)x^2}{2}+d^2 fx\right)+\frac{b\left(\frac{c\arcsin(cx)e^2 g\,x^4}{4}+\frac{2c\arcsin(cx)x^3 deg}{3}+\frac{c\arcsin(cx)x}{3}\right.}{}$
derivativedivides	$\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{\left(2dceg+e^2 cf\right)c^3 x^3}{3}+\frac{\left(c^2 d^2 g+2d\,c^2 ef\right)c^2 x^2}{2}+d^2 c^4 fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\frac{\arcsin(cx)c}{3}\right.}{}$
default	$\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{\left(2dceg+e^2 cf\right)c^3 x^3}{3}+\frac{\left(c^2 d^2 g+2d\,c^2 ef\right)c^2 x^2}{2}+d^2 c^4 fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\frac{\arcsin(cx)c}{3}\right.}{}$

```
[In] int((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/4*e^2*g*x^4+1/3*(2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b
/c*(1/4*c*arcsin(c*x)*e^2*g*x^4+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(c*
x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(c*x
)*d^2*f*c*x-1/12/c^3*(3*e^2*g*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^
2*x^2+1)^(1/2)+3/8*arcsin(c*x))-12*d^2*c^3*f*(-c^2*x^2+1)^(1/2)+(8*c*d*e*g+
4*c*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(6*c^2*
d^2*g+12*c^2*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.19

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{72\,ac^4e^2gx^4+288\,ac^4d^2fx+96\,(ac^4e^2f+2\,ac^4deg)x^3+144\,(2\,ac^4def+ac^4d^2g)x^2+3\,(24\,bc^4e^2gx^4+96}{}$$

```
[In] integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(72*a*c^4*e^2*g*x^4 + 288*a*c^4*d^2*f*x + 96*(a*c^4*e^2*f + 2*a*c^4*d
*e*g)*x^3 + 144*(2*a*c^4*d*e*f + a*c^4*d^2*g)*x^2 + 3*(24*b*c^4*e^2*g*x^4 +
 96*b*c^4*d^2*f*x - 48*b*c^2*d*e*f + 32*(b*c^4*e^2*f + 2*b*c^4*d*e*g)*x^3 +
 48*(2*b*c^4*d*e*f + b*c^4*d^2*g)*x^2 - 3*(8*b*c^2*d^2 + 3*b*e^2)*g)*arcsin
(c*x) + (18*b*c^3*e^2*g*x^3 + 128*b*c*d*e*g + 32*(b*c^3*e^2*f + 2*b*c^3*d*e
*g)*x^2 + 32*(9*b*c^3*d^2 + 2*b*c*e^2)*f + 9*(16*b*c^3*d*e*f + (8*b*c^3*d^2
 + 3*b*c*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 502 vs. $2(235) = 470$.

Time = 0.36 (sec) , antiderivative size = 502, normalized size of antiderivative = 2.02

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2fx + \frac{ad^2gx^2}{2} + adefx^2 + \frac{2adegx^3}{3} + \frac{ae^2fx^3}{3} + \frac{ae^2gx^4}{4} + bd^2fx\operatorname{asin}(cx) + \frac{bd^2gx^2\operatorname{asin}(cx)}{2} + bdefx^2\operatorname{asin}(cx) \\ a\left(d^2fx + \frac{d^2gx^2}{2} + defx^2 + \frac{2degx^3}{3} + \frac{e^2fx^3}{3} + \frac{e^2gx^4}{4}\right) \end{cases}$$

```
[In] integrate((e*x+d)**2*(g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3 +
 a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2*a
sin(c*x)/2 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3 + b*e**2*f
*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*d**2*f*sqrt(-c**2*x**2 +
1)/c + b*d**2*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d*e*f*x*sqrt(-c**2*x**2 +
1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*f*x**2*sqrt(-
c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) - b*d**2*g
*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2) + 4*b*d*e*g*sqrt(-c**2*x**
2 + 1)/(9*c**3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*s
qrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e**2*g*asin(c*x)/(32*c**4), Ne(c, 0)),
(a*(d**2*f*x + d**2*g*x**2/2 + d*e*f*x**2 + 2*d*e*g*x**3/3 + e**2*f*x**3/3
+ e**2*g*x**4/4), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.42

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}ae^2gx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + adefx^2 + \frac{1}{2}ad^2gx^2 + \frac{1}{2}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g + \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg + \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g + ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

```
[In] integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + a*d*e*f*x^2 + 1/2*a*d
^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*
x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2
*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(s
qrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^
4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4
- 3*arcsin(c*x)/c^5)*c)*b*e^2*g + a*d^2*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 491 vs. $2(225) = 450$.

Time = 0.31 (sec) , antiderivative size = 491, normalized size of antiderivative = 1.98

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}ae^2gx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + bd^2fx\arcsin(cx) + ad^2fx + \frac{(c^2x^2-1)be^2fx\arcsin(cx)}{3c^2} + \frac{2(c^2x^2-1)bdegx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdefx}{2c} + \frac{\sqrt{-c^2x^2+1}bd^2gx}{4c} + \frac{(c^2x^2-1)bdef\arcsin(cx)}{c^2} + \frac{(c^2x^2-1)bd^2g\arcsin(cx)}{2c^2} + \frac{be^2fx\arcsin(cx)}{3c^2} + \frac{2bdegx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bd^2f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2gx}{16c^3} + \frac{(c^2x^2-1)adef}{c^2} + \frac{(c^2x^2-1)ad^2g}{2c^2} + \frac{bdef\arcsin(cx)}{2c^2} + \frac{bd^2g\arcsin(cx)}{4c^2} + \frac{(c^2x^2-1)^2be^2g\arcsin(cx)}{4c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2f}{9c^3} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bdeg}{9c^3} + \frac{5\sqrt{-c^2x^2+1}be^2gx}{32c^3} + \frac{(c^2x^2-1)be^2g\arcsin(cx)}{2c^4} + \frac{\sqrt{-c^2x^2+1}be^2f}{3c^3} + \frac{2\sqrt{-c^2x^2+1}bdeg}{3c^3} + \frac{5be^2g\arcsin(cx)}{32c^4}$$

```
[In] integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + b*d^2*f*x*arcsin(c*x)
 + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 -
 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c + 1/4*sq
rt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/c^2 + 1/2*
(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3
*b*d*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2
+ 1)^(3/2)*b*e^2*g*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*
d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^2 + 1/4
*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e^2*f
/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^2
*g*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 +
1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e*g/c^3 + 5/32*b*e^2*g*arcsin(c
*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^2\,dx$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2,x)
[Out] int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2, x)
```

3.90 $\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 148

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{begx^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(9c^2df+2eg)+9c^2(ef+dg)x)\sqrt{1-c^2x^2}}{36c^3} - \frac{b(ef+dg)\arcsin(cx)}{4c^2} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx))$$

```
[Out] -1/4*b*(d*g+e*f)*arcsin(c*x)/c^2+d*f*x*(a+b*arcsin(c*x))+1/2*(d*g+e*f)*x^2*
(a+b*arcsin(c*x))+1/3*e*g*x^3*(a+b*arcsin(c*x))+1/9*b*e*g*x^2*(-c^2*x^2+1)^
(1/2)/c+1/36*b*(36*c^2*d*f+8*e*g+9*c^2*(d*g+e*f)*x)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx)) + dfx(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx)) - \frac{b\arcsin(cx)(dg+ef)}{4c^2} + \frac{begx^2\sqrt{1-c^2x^2}}{9c} + \frac{b\sqrt{1-c^2x^2}(9c^2x(dg+ef)+4(9c^2df+2eg))}{36c^3}$$

```
[In] Int[(d + e*x)*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*g*x^2*Sqrt[1 - c^2*x^2])/(9*c) + (b*(4*(9*c^2*d*f + 2*e*g) + 9*c^2*(e*
f + d*g)*x)*Sqrt[1 - c^2*x^2])/(36*c^3) - (b*(e*f + d*g)*ArcSin[c*x])/(4*c^
2) + d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 +
(e*g*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\text{integral} = dfx(a + b\arcsin(cx)) + \frac{1}{2}(ef + dg)x^2(a + b\arcsin(cx)) + \frac{1}{3}egx^3(a + b\arcsin(cx)) - (bc)\int \frac{x(6df + 3(ef + dg)x + 2egx^2)}{6\sqrt{1 - c^2x^2}}\,dx$$

$$= dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx)) - \frac{1}{6}(bc)\int \frac{x(6df+3(ef+dg)x+2egx^2)}{\sqrt{1-c^2x^2}}dx$$

$$= \frac{begx^2\sqrt{1-c^2x^2}}{9c} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx)) + \frac{b\int \frac{x(-2(9c^2df+2eg)-9c^2(ef+dg)x)}{\sqrt{1-c^2x^2}}dx}{18c}$$

$$= \frac{begx^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(9c^2df+2eg)+9c^2(ef+dg)x)\sqrt{1-c^2x^2}}{36c^3} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx)) - \frac{(b(ef+dg))\int \frac{1}{\sqrt{1-c^2x^2}}dx}{4c}$$

$$= \frac{begx^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(9c^2df+2eg)+9c^2(ef+dg)x)\sqrt{1-c^2x^2}}{36c^3} - \frac{b(ef+dg)\arcsin(cx)}{4c^2} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.93

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{6ac^3x(3d(2f+gx)+ex(3f+2gx))+b\sqrt{1-c^2x^2}(8eg+c^2(9d(4f+gx)+ex(9f+4gx)))+3bc(12c^2dfx}{36c^3}$$

```
[In] Integrate[(d + e*x)*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (6*a*c^3*x*(3*d*(2*f + g*x) + e*x*(3*f + 2*g*x)) + b*Sqrt[1 - c^2*x^2]*(8*e
*g + c^2*(9*d*(4*f + g*x) + e*x*(9*f + 4*g*x))) + 3*b*c*(12*c^2*d*f*x + 4*c
^2*e*g*x^3 + 3*d*g*(-1 + 2*c^2*x^2) + e*f*(-3 + 6*c^2*x^2))*ArcSin[c*x])/(3
6*c^3)
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.20

method	result
parts	$a\left(\frac{eg\,x^{3}}{3}+\frac{(dg+ef)x^{2}}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eg\,x^{3}}{3}+\frac{c\arcsin(cx)x^{2}dg}{2}+\frac{c\arcsin(cx)x^{2}ef}{2}+\arcsin(cx)dfcx-\frac{2eg\left(-\right.}{}\right.}{}$
derivativedivides	$\frac{\frac{a\left(\frac{eg\,c^{3}x^{3}}{3}+\frac{(dcg+ecf)c^{2}x^{2}}{2}+d\,c^{3}fx\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)eg\,c^{3}x^{3}}{3}+\frac{\arcsin(cx)c^{3}dg\,x^{2}}{2}+\frac{\arcsin(cx)c^{3}ef\,x^{2}}{2}+\arcsin(cx)d\,c^{3}fx-\frac{eg\left(-\frac{c^{2}}{}\right.}{}\right.}{}}{c}$
default	$\frac{\frac{a\left(\frac{eg\,c^{3}x^{3}}{3}+\frac{(dcg+ecf)c^{2}x^{2}}{2}+d\,c^{3}fx\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)eg\,c^{3}x^{3}}{3}+\frac{\arcsin(cx)c^{3}dg\,x^{2}}{2}+\frac{\arcsin(cx)c^{3}ef\,x^{2}}{2}+\arcsin(cx)d\,c^{3}fx-\frac{eg\left(-\frac{c^{2}}{}\right.}{}\right.}{}}{c}$

```
[In] int((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3*e*g*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/3*c*arcsin(c*x)*e*g*x^3+1/2*
c*arcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/6/c^2
*(2*e*g*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-6*d*c^2*f*
(-c^2*x^2+1)^(1/2)+(3*c*d*g+3*c*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsi
n(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.09

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{12\,ac^{3}egx^{3}+36\,ac^{3}dfx+18\,(ac^{3}ef+ac^{3}dg)x^{2}+3\,(4\,bc^{3}egx^{3}+12\,bc^{3}dfx-3\,bcef-3\,bcdg+6\,(bc^{3}ef+}{36\,c^{3}}$$

```
[In] integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/36*(12*a*c^3*e*g*x^3 + 36*a*c^3*d*f*x + 18*(a*c^3*e*f + a*c^3*d*g)*x^2 +
3*(4*b*c^3*e*g*x^3 + 12*b*c^3*d*f*x - 3*b*c*e*f - 3*b*c*d*g + 6*(b*c^3*e*f
+ b*c^3*d*g)*x^2)*arcsin(c*x) + (4*b*c^2*e*g*x^2 + 36*b*c^2*d*f + 8*b*e*g +
 9*(b*c^2*e*f + b*c^2*d*g)*x)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.80

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} adfx + \frac{adgx^2}{2} + \frac{aefx^2}{2} + \frac{aegx^3}{3} + bdfx\operatorname{asin}(cx) + \frac{bdgx^2\operatorname{asin}(cx)}{2} + \frac{befx^2\operatorname{asin}(cx)}{2} + \frac{begx^3\operatorname{asin}(cx)}{3} + \frac{bdf\sqrt{-c^2x^2+1}}{c} + \\ a\left(dfx + \frac{dgx^2}{2} + \frac{efx^2}{2} + \frac{egx^3}{3}\right) \end{cases}$$

```
[In] integrate((e*x+d)*(g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*f*x + a*d*g*x**2/2 + a*e*f*x**2/2 + a*e*g*x**3/3 + b*d*f*x*a
sin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asi
n(c*x)/3 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2 + 1)/(4*c
) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9
*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2) + 2*b*e*g*sqrt(-c
**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + e*f*x**2/2 + e*
g*x**3/3), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.34

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{3}aegx^3 + \frac{1}{2}aefx^2 + \frac{1}{2}adgx^2 + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bef + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdg + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg + adfx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

```
[In] integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*a*e*g*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x
) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcs
in(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g
+ a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.75

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{1}{3}aegx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2c^2} + \frac{begx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdf}{c} + \frac{(c^2x^2-1)aef}{2c^2} + \frac{(c^2x^2-1)adg}{2c^2} + \frac{bef\arcsin(cx)}{4c^2} + \frac{bdg\arcsin(cx)}{4c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9c^3} + \frac{\sqrt{-c^2x^2+1}beg}{3c^3}$$

```
[In] integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/3*a*e*g*x^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*a
rcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*
b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d
*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d*f
/c + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e*f*
arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*
g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \begin{cases} \frac{a\,x^2\,(d\,g+e\,f)}{2} + a\,d\,f\,x + b\,e\,g\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9} + \frac{x^3\,\mathrm{asin}(c\,x)}{3}\right) + \frac{a\,e\,g\,x^3}{3} + \frac{b\,d\,f\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} + \frac{b\,d\,g\,\left(\mathrm{asi}\right.}{} \\ \int (f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)\,dx \end{cases}$$

```
[In] int((f + g*x)*(a + b*asin(c*x))*(d + e*x),x)
```

```
[Out] piecewise(0 < c, (a*x^2*(d*g + e*f))/2 + a*d*f*x + b*e*g*(((1/c^2 - x^2)^(1
/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) + (a*e*g*x^3)/3 + (b*d*f*((- c^2*
x^2 + 1)^(1/2) + c*x*asin(c*x)))/c + (b*d*g*((asin(c*x)*(2*c^2*x^2 - 1))/4
+ (c*x*(- c^2*x^2 + 1)^(1/2))/4))/c^2 + (b*e*f*((asin(c*x)*(2*c^2*x^2 - 1))
/4 + (c*x*(- c^2*x^2 + 1)^(1/2))/4))/c^2, ~0 < c, int((f + g*x)*(a + b*asin
(c*x))*(d + e*x), x))
```

3.91 $\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 344

$$
\begin{aligned}
\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx &= \frac{bg\sqrt{1-c^2x^2}}{ce}-\frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} \\
&+\frac{gx(a+b\arcsin(cx))}{e} \\
&+\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\
&+\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} \\
&-\frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} \\
&+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&-\frac{ib(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\
&-\frac{ib(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}
\end{aligned}
$$

```
[Out] -1/2*I*b*(-d*g+e*f)*arcsin(c*x)^2/e^2+g*x*(a+b*arcsin(c*x))/e-b*(-d*g+e*f)*
arcsin(c*x)*ln(e*x+d)/e^2+(-d*g+e*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^2+b*(-d*
g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(
1/2)))/e^2+b*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*
d+(c^2*d^2-e^2)^(1/2)))/e^2-I*b*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1
)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2-I*b*(-d*g+e*f)*polylog(2,I*e*(I*c*x
+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2+b*g*(-c^2*x^2+1)^(1/2)/
c/e
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {45, 4837, 12, 6874, 267, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2} + \frac{gx(a+b\arcsin(cx))}{e} - \frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{b\arcsin(cx)(ef-dg)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{b\arcsin(cx)(ef-dg)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^2} - \frac{ib\arcsin(cx)^2(ef-dg)}{2e^2} - \frac{b\arcsin(cx)(ef-dg)\log(d+ex)}{e^2} + \frac{bg\sqrt{1-c^2x^2}}{ce}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] (b*g*Sqrt[1 - c^2*x^2])/(c*e) - ((I/2)*b*(e*f - d*g)*ArcSin[c*x]^2)/e^2 + (
g*x*(a + b*ArcSin[c*x]))/e + (b*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*A
rcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^2 + (b*(e*f - d*g)*ArcSin[c*x]
*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2 - (b*(e*
f - d*g)*ArcSin[c*x]*Log[d + e*x])/e^2 + ((e*f - d*g)*(a + b*ArcSin[c*x])*L
og[d + e*x])/e^2 - (I*b*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
 - Sqrt[c^2*d^2 - e^2])])/e^2 - (I*b*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSi
n[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
```

```
&& PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{gx(a+b\arcsin(cx))}{e}+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -(bc)\int \frac{egx+(ef-dg)\log(d+ex)}{e^2\sqrt{1-c^2x^2}}\,dx \\
&= \frac{gx(a+b\arcsin(cx))}{e}+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2}-\frac{(bc)\int \frac{egx+(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^2} \\
&= \frac{gx(a+b\arcsin(cx))}{e}+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -\frac{(bc)\int \left(\frac{egx}{\sqrt{1-c^2x^2}}+\frac{(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2} \\
&= \frac{gx(a+b\arcsin(cx))}{e}+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -\frac{(bcg)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e}-\frac{(bc(ef-dg))\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^2} \\
&= \frac{bg\sqrt{1-c^2x^2}}{ce}+\frac{gx(a+b\arcsin(cx))}{e}-\frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} \\
&\quad +\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2}+\frac{(bc(ef-dg))\int \frac{\arcsin(cx)}{cd+cex}\,dx}{e}
\end{aligned}$$

$$= \frac{bg\sqrt{1-c^2x^2}}{ce} + \frac{gx(a+b\arcsin(cx))}{e} - \frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} + \frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(bc(ef-dg))\text{Subst}\left(\int \frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx, x, \arcsin(cx)\right)}{e}$$

$$= \frac{bg\sqrt{1-c^2x^2}}{ce} - \frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} + \frac{gx(a+b\arcsin(cx))}{e} - \frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} + \frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(bc(ef-dg))\text{Subst}\left(\int \frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e} + \frac{(bc(ef-dg))\text{Subst}\left(\int \frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e}$$

$$= \frac{bg\sqrt{1-c^2x^2}}{ce} - \frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} + \frac{gx(a+b\arcsin(cx))}{e} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} + \frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{(b(ef-dg))\text{Subst}\left(\int \log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^2} - \frac{(b(ef-dg))\text{Subst}\left(\int \log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^2}$$

$$= \frac{bg\sqrt{1-c^2x^2}}{ce} - \frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} + \frac{gx(a+b\arcsin(cx))}{e} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} + \frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(ib(ef-dg))\text{Subst}\left(\int \frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^2} + \frac{(ib(ef-dg))\text{Subst}\left(\int \frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^2}$$

$$= \frac{bg\sqrt{1-c^2x^2}}{ce} - \frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} + \frac{gx(a+b\arcsin(cx))}{e} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} + \frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{ib(ef-dg)\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{ib(ef-dg)\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}dx$$

$$= \frac{\frac{beg\sqrt{1-c^2x^2}}{c} - \frac{1}{2}ib(ef-dg)\arcsin(cx)^2 + egx(a+b\arcsin(cx)) + b(ef-dg)\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e}}\right.}{}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] ((b*e*g*Sqrt[1 - c^2*x^2])/c - (I/2)*b*(e*f - d*g)*ArcSin[c*x]^2 + e*g*x*(a
 + b*ArcSin[c*x]) + b*(e*f - d*g)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]
))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e
*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*(e*f - d*g)*ArcSin[c*x
```

```
]*Log[d + e*x] + (e*f - d*g)*(a + b*ArcSin[c*x])*Log[d + e*x] - I*b*(e*f -
d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - I*b*
(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]
)/e^2
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1565 vs. 2(357) = 714.

Time = 1.90 (sec) , antiderivative size = 1566, normalized size of antiderivative = 4.55

method	result	size
parts	Expression too large to display	1566
derivativedivides	Expression too large to display	1584
default	Expression too large to display	1584

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

```
[Out] a*(g/e*x+(-d*g+e*f)/e^2*ln(e*x+d))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((I
*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^
2)^(1/2)))+b*g*(-c^2*x^2+1)^(1/2)/c/e-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2
)))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e*f*arcsin(c*x
)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2)
)/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+
e^2)^(1/2)))*d^2-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-
b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-1/2*I*b*arcsin(c*
x)^2/e*f+I*b*e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-
c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e*f/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c
^2*d^2+e^2)^(1/2)))*d^2+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-b*e
*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d
^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*e*f*arcsin(c*x)/(c^2*d^2-e^2
)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2
*d^2+e^2)^(1/2)))+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^
2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/2*I*b*a
rcsin(c*x)^2/e^2*d*g-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)
^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e*f/(
c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2)
```

```
)/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+I*b*e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c
*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))
)+b*g/e*arcsin(c*x)*x
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
[Out] integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e*x + d), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{d+ex}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
[Out] a*g*(x/e - d*log(e*x + d)/e^2) + a*f*log(e*x + d)/e + integrate((b*g*x + b*
f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{d+e\,x}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x),x)
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x), x)
```

3.92 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 358

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = -\frac{ibg\arcsin(cx)^2}{2e^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{ibg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{ibg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}$$

```
[Out] -1/2*I*b*g*arcsin(c*x)^2/e^2-(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)-b*g*a
rcsin(c*x)*ln(e*x+d)/e^2+g*(a+b*arcsin(c*x))*ln(e*x+d)/e^2+b*g*arcsin(c*x)*
ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2+b*g*arcs
in(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2-
I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e
^2-I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2))
)/e^2+b*c*(-d*g+e*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e^2/(c^2*d^2-e^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 358, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {45, 4837, 12, 6874, 739, 210, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2} - \frac{ibg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{ibg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^2} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} - \frac{ibg\arcsin(cx)^2}{2e^2} + \frac{bc(ef-dg)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] ((-1/2*I)*b*g*ArcSin[c*x]^2)/e^2 - ((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(
d + e*x)) + (b*c*(e*f - d*g)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt
[1 - c^2*x^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + (b*g*ArcSin[c*x]*Log[1 - (I*e*
E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^2 + (b*g*ArcSin[c*x]*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2 - (b*g*ArcSi
n[c*x]*Log[d + e*x])/e^2 + (g*(a + b*ArcSin[c*x])*Log[d + e*x])/e^2 - (I*b*
g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^2 - (I
*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -(bc)\int\frac{-ef\left(1-\frac{dg}{ef}\right)+g(d+ex)\log(d+ex)}{e^2(d+ex)\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -\frac{(bc)\int\frac{-ef\left(1-\frac{dg}{ef}\right)+g(d+ex)\log(d+ex)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2} \\
&= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} \\
&\quad -\frac{(bc)\int\left(\frac{-ef+dg}{(d+ex)\sqrt{1-c^2x^2}}+\frac{g\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2}
\end{aligned}$$

$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{(bcg)\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^2} + \frac{(bc(ef-dg))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2}$$

$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(bcg)\int \frac{\arcsin(cx)}{cd+cex}\,dx}{e} - \frac{(bc(ef-dg))\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^2}$$

$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(bcg)\text{Subst}\left(\int \frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx, x, \arcsin(cx)\right)}{e}$$

$$= -\frac{ibg\arcsin(cx)^2}{2e^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(bcg)\text{Subst}\left(\int \frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e} + \frac{(bcg)\text{Subst}\left(\int \frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e}$$

$$= -\frac{ibg\arcsin(cx)^2}{2e^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{(bg)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^2} - \frac{(bg)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^2}$$

$$= -\frac{ibg\arcsin(cx)^2}{2e^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} + \frac{(ibg)\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^2} + \frac{(ibg)\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^2}$$

$$= -\frac{ibg\arcsin(cx)^2}{2e^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} + \frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{bg\arcsin(cx)\log(d+ex)}{e^2} + \frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} - \frac{ibg\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} - \frac{ibg\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.93

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$
$$= \frac{-\frac{1}{2}ibg\arcsin(cx)^2 - \frac{(ef-dg)(a+b\arcsin(cx))}{d+ex} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}} + bg\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin(c}}{-cd+\sqrt{c^2d^2}}\right.}{}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] ((-1/2*I)*b*g*ArcSin[c*x]^2 - ((e*f - d*g)*(a + b*ArcSin[c*x]))/(d + e*x) +
 (b*c*(e*f - d*g)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^
2])])/Sqrt[c^2*d^2 - e^2] + b*g*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]))
/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*g*ArcSin[c*x]*Log[d + e*x] + g*(a
+ b*ArcSin[c*x])*Log[d + e*x] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c
*d - Sqrt[c^2*d^2 - e^2])] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
+ Sqrt[c^2*d^2 - e^2])])/e^2
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 953 vs. $2(367) = 734$.

Time = 2.27 (sec) , antiderivative size = 954, normalized size of antiderivative = 2.66

method	result
derivativedivides	$\frac{ac\left(\frac{g\ln(cex+dc)}{e^2}+\frac{c(dg-ef)}{e^2(cex+dc)}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cex+dc)}+\frac{ig\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}-\right.}{}$
default	$\frac{ac\left(\frac{g\ln(cex+dc)}{e^2}+\frac{c(dg-ef)}{e^2(cex+dc)}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cex+dc)}+\frac{ig\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}-\right.}{}$
parts	$a\left(-\frac{-dg+ef}{e^2(ex+d)}+\frac{g\ln(ex+d)}{e^2}\right)+\frac{b\left(-\frac{ic\arcsin(cx)^2g}{2e^2}+\frac{(dg-ef)\arcsin(cx)c^2}{e^2(cex+dc)}-\frac{ic^3g\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d}}{idc-\sqrt{-c^2d^2+e^2}}\right.}{e^2\left(c^2d^2-e^2\right)}\right.}{}$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a*c*(g/e^2*ln(c*e*x+c*d)+c*(d*g-e*f)/e^2/(c*e*x+c*d))+b*c*(-1/2*I*g*ar
csin(c*x)^2/e^2+(d*g-e*f)*arcsin(c*x)*c/e^2/(c*e*x+c*d)+I*g/(c^2*d^2-e^2)*d
```

```
ilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2
*d^2+e^2)^(1/2)))-I/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c^2*d^2-2*I/e*c*
f/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-2*d*c)/
(c^2*d^2-e^2)^(1/2))+1/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c
^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c^2*
d^2+1/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2-g*arcsin(c*x)
/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))
/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+
2*I/e^2*c*d*g/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1
/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))+I*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I/e^2
*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(
1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^2}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
[Out] integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^2
), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})\,(f+gx)}{(d+ex)^2}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{(d+e\,x)^2}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2,x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2, x)
```

3.93 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 202

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\left(c^2d^2-e^2\right)(d+ex)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} - \frac{bc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^2\left(c^2d^2-e^2\right)^{3/2}}$$

```
[Out] 1/2*b*g^2*arcsin(c*x)/e^2/(-d*g+e*f)-1/2*(g*x+f)^2*(a+b*arcsin(c*x))/(-d*g+
e*f)/(e*x+d)^2-1/2*b*c*(2*e^2*g-c^2*d*(d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^
2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(3/2)+1/2*b*c*(-d*g+e*f)
*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {37, 4837, 12, 1665, 858, 222, 739, 210}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(2e^2g-c^2d(dg+ef))}{2e^2\left(c^2d^2-e^2\right)^{3/2}} + \frac{bc\sqrt{1-c^2x^2}(ef-dg)}{2e\left(c^2d^2-e^2\right)(d+ex)}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] (b*c*(e*f - d*g)*Sqrt[1 - c^2*x^2])/(2*e*(c^2*d^2 - e^2)*(d + e*x)) + (b*g^
2*ArcSin[c*x])/(2*e^2*(e*f - d*g)) - ((f + g*x)^2*(a + b*ArcSin[c*x]))/(2*(
e*f - d*g)*(d + e*x)^2) - (b*c*(2*e^2*g - c^2*d*(e*f + d*g))*ArcTan[(e + c^
2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^2*(c^2*d^2 - e^2)^(3/
2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 858

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
```

```
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$\text{integral} = -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} - (bc)\int -\frac{(f+gx)^2}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} + \frac{(bc)\int \frac{(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2(ef-dg)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\,(c^2d^2-e^2)\,(d+ex)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} + \frac{(bc)\int \frac{c^2df^2-g(2ef-dg)+\left(\frac{c^2d^2}{e}-e\right)g^2x}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2\,(c^2d^2-e^2)\,(ef-dg)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\,(c^2d^2-e^2)\,(d+ex)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} + \frac{(bcg^2)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{2e^2(ef-dg)} - \frac{(bc(2e^2g-c^2d(ef+dg)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^2\,(c^2d^2-e^2)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\,(c^2d^2-e^2)\,(d+ex)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} + \frac{(bc(2e^2g-c^2d(ef+dg)))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e^2\,(c^2d^2-e^2)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\,(c^2d^2-e^2)\,(d+ex)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} - \frac{bc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^2\,(c^2d^2-e^2)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.30

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$= \frac{\frac{a(-ef+dg)}{(d+ex)^2} - \frac{2ag}{d+ex} - \frac{bce(ef-dg)\sqrt{1-c^2x^2}}{(-c^2d^2+e^2)(d+ex)} - \frac{b(dg+e(f+2gx))\arcsin(cx)}{(d+ex)^2} + \frac{bc(-2e^2g+c^2d(ef+dg))\log(d+ex)}{(cd-e)(cd+e)\sqrt{-c^2d^2+e^2}} + \frac{bc(-2e^2g+c^2d(ef+dg}{(-cd}}{2e^2}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] ((a*(-(e*f) + d*g))/(d + e*x)^2 - (2*a*g)/(d + e*x) - (b*c*e*(e*f - d*g)*Sq
rt[1 - c^2*x^2])/((-(c^2*d^2) + e^2)*(d + e*x)) - (b*(d*g + e*(f + 2*g*x))*
ArcSin[c*x])/(d + e*x)^2 + (b*c*(-2*e^2*g + c^2*d*(e*f + d*g))*Log[d + e*x]
)/((c*d - e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]) + (b*c*(-2*e^2*g + c^2*d*(e*
f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(
c*d) + e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]))/(2*e^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 534 vs. 2(186) = 372.

Time = 2.56 (sec) , antiderivative size = 535, normalized size of antiderivative = 2.65

method	result
parts	$a\left(-\frac{g}{e^{2}(ex+d)}-\frac{-dg+ef}{2e^{2}(ex+d)^{2}}\right)+\frac{b\left(\frac{c^{3}\arcsin(cx)dg}{2e^{2}(cex+dc)^{2}}-\frac{c^{3}\arcsin(cx)f}{2e(cex+dc)^{2}}-\frac{c^{2}\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{c^{2}\left(-\frac{2g\ln\left(-\frac{2(c^{2}d^{2}-e^{2})}{e^{2}}+\frac{2dc}{\cdots}\right.}{\cdots}\right.}{\cdots}\right.}{\cdots}$
derivativedivides	$\frac{ac^{2}\left(\frac{c(dg-ef)}{2e^{2}(cex+dc)^{2}}-\frac{g}{e^{2}(cex+dc)}\right)+bc^{2}\left(\frac{\arcsin(cx)cdg}{2e^{2}(cex+dc)^{2}}-\frac{\arcsin(cx)cf}{2e(cex+dc)^{2}}-\frac{\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{-\frac{2g\ln\left(-\frac{2(c^{2}d^{2}-e^{2})}{e^{2}}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+\cdots\right.}{\cdots}}{\cdots}\right.}{\cdots}$
default	$\frac{ac^{2}\left(\frac{c(dg-ef)}{2e^{2}(cex+dc)^{2}}-\frac{g}{e^{2}(cex+dc)}\right)+bc^{2}\left(\frac{\arcsin(cx)cdg}{2e^{2}(cex+dc)^{2}}-\frac{\arcsin(cx)cf}{2e(cex+dc)^{2}}-\frac{\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{-\frac{2g\ln\left(-\frac{2(c^{2}d^{2}-e^{2})}{e^{2}}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+\cdots\right.}{\cdots}}{\cdots}\right.}{\cdots}$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-g/e^2/(e*x+d)-1/2*(-d*g+e*f)/e^2/(e*x+d)^2)+b/c*(1/2*c^3*arcsin(c*x)/e^
2/(c*e*x+c*d)^2*d*g-1/2*c^3*arcsin(c*x)/e/(c*e*x+c*d)^2*f-c^2*arcsin(c*x)*g
/e^2/(c*e*x+c*d)+1/2*c^2/e^2*(-2*g/e/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2
*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e
)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-c*(d*g-e*f)/
e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c
^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-
2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x
+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(185) = 370$.

Time = 3.24 (sec) , antiderivative size = 1184, normalized size of antiderivative = 5.86

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Too large to display}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(4*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x + (b*c^3*d^3*e*f + (b*
c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*c^3*d^4 - 2*b*c*d^2*e
^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e^3)*g)*x)*sqrt(-c^2*d^
2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqrt(-c
^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x
+ d^2)) + 2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*f + 2*(a*c^4*d^5 - 2*a*
c^2*d^3*e^2 + a*d*e^4)*g + 2*(2*(b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*g*x
 + (b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*f + (b*c^4*d^5 - 2*b*c^2*d^3*e^2
 + b*d*e^4)*g)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*((b*c^3*d^3*e^2 - b*c*d*e
^4)*f - (b*c^3*d^4*e - b*c*d^2*e^3)*g + ((b*c^3*d^2*e^3 - b*c*e^5)*f - (b*c
^3*d^3*e^2 - b*c*d*e^4)*g)*x))/(c^4*d^6*e^2 - 2*c^2*d^4*e^4 + d^2*e^6 + (c^
4*d^4*e^4 - 2*c^2*d^2*e^6 + e^8)*x^2 + 2*(c^4*d^5*e^3 - 2*c^2*d^3*e^5 + d*e
^7)*x), -1/2*(2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x - (b*c^3*d^3*e*
f + (b*c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*c^3*d^4 - 2*b*
c*d^2*e^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e^3)*g)*x)*sqrt(
c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/
(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + (a*c^4*d^4*e - 2*a*c^2*d^2*e^3
 + a*e^5)*f + (a*c^4*d^5 - 2*a*c^2*d^3*e^2 + a*d*e^4)*g + (2*(b*c^4*d^4*e -
 2*b*c^2*d^2*e^3 + b*e^5)*g*x + (b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*f +
 (b*c^4*d^5 - 2*b*c^2*d^3*e^2 + b*d*e^4)*g)*arcsin(c*x) - sqrt(-c^2*x^2 + 1
)*((b*c^3*d^3*e^2 - b*c*d*e^4)*f - (b*c^3*d^4*e - b*c*d^2*e^3)*g + ((b*c^3*
d^2*e^3 - b*c*e^5)*f - (b*c^3*d^3*e^2 - b*c*d*e^4)*g)*x))/(c^4*d^6*e^2 - 2*
c^2*d^4*e^4 + d^2*e^6 + (c^4*d^4*e^4 - 2*c^2*d^2*e^6 + e^8)*x^2 + 2*(c^4*d^
5*e^3 - 2*c^2*d^3*e^5 + d*e^7)*x)]
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^3}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{(d+e\,x)^3}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3,x)
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3, x)
```

3.94 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 257

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4} dx = \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e(c^2d^2-e^2)(d+ex)^2} + \frac{bc(c^2df-eg)\sqrt{1-c^2x^2}}{2(c^2d^2-e^2)^2(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2} + \frac{bc^3(e^2(ef-4dg)+c^2d^2(2ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^2(c^2d^2-e^2)^{5/2}}$$

```
[Out] -1/3*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^3-1/2*g*(a+b*arcsin(c*x))/e^2
/(e*x+d)^2+1/6*b*c^3*(e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+2*e*f))*arctan((c^2*d*x
+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)+1/6*b*c
*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)^2+1/2*b*c*(c^2*d*f-e
*g)*(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)^2/(e*x+d)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {45, 4837, 12, 849, 821, 739, 210}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$
$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$
$$+ \frac{bc^3\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(c^2d^2(dg+2ef)+e^2(ef-4dg))}{6e^2(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bc\sqrt{1-c^2x^2}(c^2df-eg)}{2(c^2d^2-e^2)^2(d+ex)} + \frac{bc\sqrt{1-c^2x^2}(ef-dg)}{6e(c^2d^2-e^2)(d+ex)^2}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

```
[Out] (b*c*(e*f - d*g)*Sqrt[1 - c^2*x^2])/(6*e*(c^2*d^2 - e^2)*(d + e*x)^2) + (b*
c*(c^2*d*f - e*g)*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)^2*(d + e*x)) - ((e*
f - d*g)*(a + b*ArcSin[c*x]))/(3*e^2*(d + e*x)^3) - (g*(a + b*ArcSin[c*x]))
/(2*e^2*(d + e*x)^2) + (b*c^3*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*A
rcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(6*e^2*(c^2*d
^2 - e^2)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
```

```
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2} \\
&\quad -(bc)\int\frac{-2ef-dg-3egx}{6e^2(d+ex)^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}-\frac{(bc)\int\frac{-2ef-dg-3egx}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^2} \\
&= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3} \\
&\quad -\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}-\frac{(bc)\int\frac{2\left(3e^2g-c^2d(2ef+dg)\right)+2c^2e(ef-dg)x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e^2\left(c^2d^2-e^2\right)} \\
&= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc(c^2df-eg)\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3} \\
&\quad -\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}+\frac{\left(bc^3\left(e^2(ef-4dg)+c^2d^2(2ef+dg)\right)\right)\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{6e^2\left(c^2d^2-e^2\right)^2}
\end{aligned}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc(c^2df-eg)\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2} - \frac{\left(bc^3(e^2(ef-4dg)+c^2d^2(2ef+dg))\right)\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{6e^2\left(c^2d^2-e^2\right)^2}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc(c^2df-eg)\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}+\frac{bc^3(e^2(ef-4dg)+c^2d^2(2ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^2\left(c^2d^2-e^2\right)^{5/2}}$$

Mathematica [A] (verified)

Time = 0.76 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.25

$$\int\frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$= \frac{\frac{a(-2ef+2dg)}{(d+ex)^3}-\frac{3ag}{(d+ex)^2}+\frac{bce\sqrt{1-c^2x^2}\left(c^2d(4def-d^2g+3e^2fx)-e^2(2dg+e(f+3gx))\right)}{(-c^2d^2+e^2)^2(d+ex)^2}-\frac{b(2ef+dg+3egx)\arcsin(cx)}{(d+ex)^3}+\frac{bc^3\left(e^2(ef-4dg\right.}{(-cd+e)}}{6e^2}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

```
[Out] ((a*(-2*e*f + 2*d*g))/(d + e*x)^3 - (3*a*g)/(d + e*x)^2 + (b*c*e*Sqrt[1 - c
^2*x^2]*(c^2*d*(4*d*e*f - d^2*g + 3*e^2*f*x) - e^2*(2*d*g + e*(f + 3*g*x)))
)/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (b*(2*e*f + d*g + 3*e*g*x)*ArcSin[c*
x])/(d + e*x)^3 + (b*c^3*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Log[d
+ e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (b*c^3*(e^2*(
e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e
^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2])
)/(6*e^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 907 vs. $2(237) = 474$.

Time = 3.43 (sec) , antiderivative size = 908, normalized size of antiderivative = 3.53

method	result
parts	$a\left(-\frac{g}{2e^2(ex+d)^2}-\frac{-dg+ef}{3e^2(ex+d)^3}\right)+\frac{b\left(\frac{c^4\arcsin(cx)dg}{3e^2(cex+dc)^3}-\frac{c^4\arcsin(cx)f}{3e(cex+dc)^3}-\frac{c^3\arcsin(cx)g}{2e^2(cex+dc)^2}+\frac{c^3\left(3g\left(\frac{e^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc(\cdots}{\cdots}}}{\left(c^2d^2-e^2\right)(\cdots}\cdots\right)\cdots\right)}{\cdots}\cdots\right)}{\cdots}$

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/2*g/e^2/(e*x+d)^2-1/3*(-d*g+e*f)/e^2/(e*x+d)^3)+b/c*(1/3*c^4*arcsin(c
*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^4*arcsin(c*x)/e/(c*e*x+c*d)^3*f-1/2*c^3*arc
sin(c*x)*g/e^2/(c*e*x+c*d)^2+1/6*c^3/e^2*(3*g/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x
+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/
(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(
c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)
-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-2*c*(d*g-e*f)/e^3*(1/2/(c^2*d^2-e^
2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)
^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/
e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^
2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2
*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)
^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((
-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*
x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 946 vs. $2(237) = 474$.

Time = 16.15 (sec) , antiderivative size = 1920, normalized size of antiderivative = 7.47

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] [-1/12*(6*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2*e^5 - a*e^7)*g*x - s
qrt(-c^2*d^2 + e^2)*(((2*b*c^5*d^2*e^4 + b*c^3*e^6)*f + (b*c^5*d^3*e^3 - 4*
b*c^3*d*e^5)*g)*x^3 + 3*((2*b*c^5*d^3*e^3 + b*c^3*d*e^5)*f + (b*c^5*d^4*e^2
 - 4*b*c^3*d^2*e^4)*g)*x^2 + (2*b*c^5*d^5*e + b*c^3*d^3*e^3)*f + (b*c^5*d^6
 - 4*b*c^3*d^4*e^2)*g + 3*((2*b*c^5*d^4*e^2 + b*c^3*d^2*e^4)*f + (b*c^5*d^5
*e - 4*b*c^3*d^3*e^3)*g)*x)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e
^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/
(e^2*x^2 + 2*d*e*x + d^2)) + 4*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2
*e^5 - a*e^7)*f + 2*(a*c^6*d^7 - 3*a*c^4*d^5*e^2 + 3*a*c^2*d^3*e^4 - a*d*e^
6)*g + 2*(3*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*e^7)*g*x +
 2*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*e^7)*f + (b*c^6*d^7
 - 3*b*c^4*d^5*e^2 + 3*b*c^2*d^3*e^4 - b*d*e^6)*g)*arcsin(c*x) - 2*sqrt(-c^
2*x^2 + 1)*(3*((b*c^5*d^3*e^4 - b*c^3*d*e^6)*f - (b*c^3*d^2*e^5 - b*c*e^7)*
g)*x^2 + (4*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + b*c*d*e^6)*f - (b*c^5*d^6*e +
 b*c^3*d^4*e^3 - 2*b*c*d^2*e^5)*g + ((7*b*c^5*d^4*e^3 - 8*b*c^3*d^2*e^5 + b
*c*e^7)*f - (b*c^5*d^5*e^2 + 4*b*c^3*d^3*e^4 - 5*b*c*d*e^6)*g)*x))/(c^6*d^9
*e^2 - 3*c^4*d^7*e^4 + 3*c^2*d^5*e^6 - d^3*e^8 + (c^6*d^6*e^5 - 3*c^4*d^4*e
```

```
^7 + 3*c^2*d^2*e^9 - e^11)*x^3 + 3*(c^6*d^7*e^4 - 3*c^4*d^5*e^6 + 3*c^2*d^3
*e^8 - d*e^10)*x^2 + 3*(c^6*d^8*e^3 - 3*c^4*d^6*e^5 + 3*c^2*d^4*e^7 - d^2*e
^9)*x), -1/6*(3*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2*e^5 - a*e^7)*g
*x - sqrt(c^2*d^2 - e^2)*(((2*b*c^5*d^2*e^4 + b*c^3*e^6)*f + (b*c^5*d^3*e^3
 - 4*b*c^3*d*e^5)*g)*x^3 + 3*((2*b*c^5*d^3*e^3 + b*c^3*d*e^5)*f + (b*c^5*d^
4*e^2 - 4*b*c^3*d^2*e^4)*g)*x^2 + (2*b*c^5*d^5*e + b*c^3*d^3*e^3)*f + (b*c^
5*d^6 - 4*b*c^3*d^4*e^2)*g + 3*((2*b*c^5*d^4*e^2 + b*c^3*d^2*e^4)*f + (b*c^
5*d^5*e - 4*b*c^3*d^3*e^3)*g)*x)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*s
qrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + 2*(a*c^6*d^6
*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2*e^5 - a*e^7)*f + (a*c^6*d^7 - 3*a*c^4*d^
5*e^2 + 3*a*c^2*d^3*e^4 - a*d*e^6)*g + (3*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 +
3*b*c^2*d^2*e^5 - b*e^7)*g*x + 2*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d
^2*e^5 - b*e^7)*f + (b*c^6*d^7 - 3*b*c^4*d^5*e^2 + 3*b*c^2*d^3*e^4 - b*d*e^
6)*g)*arcsin(c*x) - sqrt(-c^2*x^2 + 1)*(3*((b*c^5*d^3*e^4 - b*c^3*d*e^6)*f
- (b*c^3*d^2*e^5 - b*c*e^7)*g)*x^2 + (4*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + b
*c*d*e^6)*f - (b*c^5*d^6*e + b*c^3*d^4*e^3 - 2*b*c*d^2*e^5)*g + ((7*b*c^5*d
^4*e^3 - 8*b*c^3*d^2*e^5 + b*c*e^7)*f - (b*c^5*d^5*e^2 + 4*b*c^3*d^3*e^4 -
5*b*c*d*e^6)*g)*x))/(c^6*d^9*e^2 - 3*c^4*d^7*e^4 + 3*c^2*d^5*e^6 - d^3*e^8
+ (c^6*d^6*e^5 - 3*c^4*d^4*e^7 + 3*c^2*d^2*e^9 - e^11)*x^3 + 3*(c^6*d^7*e^4
 - 3*c^4*d^5*e^6 + 3*c^2*d^3*e^8 - d*e^10)*x^2 + 3*(c^6*d^8*e^3 - 3*c^4*d^6
*e^5 + 3*c^2*d^4*e^7 - d^2*e^9)*x)]
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{(d+ex)^4}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
[Out] -1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3*
a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((3*b*e*g*x + 2*b*e
*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^5*x^3 + 3*d*e
^4*x^2 + 3*d^2*e^3*x + d^3*e^2)*integrate(1/6*(3*b*c*e*g*x + 2*b*c*e*f + b*
```

```
c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^5*x^7 + 3*c^4*d*e^4*
x^6 - 3*c^2*d^2*e^3*x^3 - c^2*d^3*e^2*x^2 + (3*c^4*d^2*e^3 - c^2*e^5)*x^5 +
 (c^4*d^3*e^2 - 3*c^2*d*e^4)*x^4 + (c^2*e^5*x^5 + 3*c^2*d*e^4*x^4 - 3*d^2*e
^3*x - d^3*e^2 + (3*c^2*d^2*e^3 - e^5)*x^3 + (c^2*d^3*e^2 - 3*d*e^4)*x^2)*e
^(log(c*x + 1) + log(-c*x + 1))), x))/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x
+ d^3*e^2)
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^4}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4,x)
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4, x)
```

3.95 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 360

$$\begin{aligned}
&\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx \\
&= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e\left(c^2d^2-e^2\right)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^2(d+ex)^2} \\
&\quad + \frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^3(d+ex)} \\
&\quad - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} \\
&\quad - \frac{bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^2\left(c^2d^2-e^2\right)^{7/2}}
\end{aligned}$$

```
[Out] -1/4*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^4-1/3*g*(a+b*arcsin(c*x))/e^2
/(e*x+d)^3-1/24*b*c^3*(4*e^4*g-c^2*d*e^2*(-13*d*g+9*e*f)-2*c^4*d^3*(d*g+3*e
*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^
2-e^2)^(7/2)+1/12*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)
^3-1/24*b*c*(4*e^2*g-c^2*d*(-d*g+5*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)
^2/(e*x+d)^2+1/24*b*c^3*(4*e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+11*e*f))*(-c^2*x^2
+1)^(1/2)/e/(c^2*d^2-e^2)^3/(e*x+d)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 360, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {45, 4837, 12, 849, 821, 739, 210}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$
$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$
$$- \frac{bc^3\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(-2c^4d^3(dg+3ef)-c^2de^2(9ef-13dg)+4e^4g)}{24e^2(c^2d^2-e^2)^{7/2}}$$
$$- \frac{bc\sqrt{1-c^2x^2}(4e^2g-c^2d(5ef-dg))}{24e(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc\sqrt{1-c^2x^2}(ef-dg)}{12e(c^2d^2-e^2)(d+ex)^3}$$
$$+ \frac{bc^3\sqrt{1-c^2x^2}(c^2d^2(dg+11ef)+4e^2(ef-4dg))}{24e(c^2d^2-e^2)^3(d+ex)}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

```
[Out] (b*c*(e*f - d*g)*Sqrt[1 - c^2*x^2])/(12*e*(c^2*d^2 - e^2)*(d + e*x)^3) - (b
*c*(4*e^2*g - c^2*d*(5*e*f - d*g))*Sqrt[1 - c^2*x^2])/(24*e*(c^2*d^2 - e^2)
^2*(d + e*x)^2) + (b*c^3*(4*e^2*(e*f - 4*d*g) + c^2*d^2*(11*e*f + d*g))*Sqr
t[1 - c^2*x^2])/(24*e*(c^2*d^2 - e^2)^3*(d + e*x)) - ((e*f - d*g)*(a + b*Ar
cSin[c*x]))/(4*e^2*(d + e*x)^4) - (g*(a + b*ArcSin[c*x]))/(3*e^2*(d + e*x)^
3) - (b*c^3*(4*e^4*g - c^2*d*e^2*(9*e*f - 13*d*g) - 2*c^4*d^3*(3*e*f + d*g)
)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(24*e^2*(c
^2*d^2 - e^2)^(7/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
```

```
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} \\
&\quad - (bc)\int \frac{-3ef-dg-4egx}{12e^2(d+ex)^4\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{(bc)\int \frac{-3ef-dg-4egx}{(d+ex)^4\sqrt{1-c^2x^2}}\,dx}{12e^2}
\end{aligned}
$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3} - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{(bc)\int \frac{3(4e^2g-c^2d(3ef+dg))+6c^2e(ef-dg)x}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{36e^2(c^2d^2-e^2)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^2(d+ex)^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{(bc)\int \frac{-6c^2(2e^2(ef-3dg)+c^2d^2(3ef+dg))-3c^2e(4e^2g-c^2d(5ef-dg))x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{72e^2(c^2d^2-e^2)^2}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^3(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{(bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{24e^2(c^2d^2-e^2)^3}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^3(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} + \frac{(bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg)))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{24e^2(c^2d^2-e^2)^3}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^3(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} - \frac{bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^2(c^2d^2-e^2)^{7/2}}$$

Mathematica [A] (verified)

Time = 1.07 (sec) , antiderivative size = 418, normalized size of antiderivative = 1.16

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$

$$= \frac{\frac{a(-6ef+6dg)}{(d+ex)^4} - \frac{8ag}{(d+ex)^3} - \frac{be\sqrt{1-c^2x^2}\left(c^5d^2\left(-2d^3g+11e^3fx^2+d^2e(18f+gx)+de^2x(27f+gx)\right)+2ce^4(dg+e(f+2gx))-c^3e^2\left(15d^3g-4e^3fx^2+\right.\right.}{(-c^2d^2+e^2)^3(d+ex)^3}}{}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

```
[Out] ((a*(-6*e*f + 6*d*g))/(d + e*x)^4 - (8*a*g)/(d + e*x)^3 - (b*e*Sqrt[1 - c^2
*x^2]*(c^5*d^2*(-2*d^3*g + 11*e^3*f*x^2 + d^2*e*(18*f + g*x) + d*e^2*x*(27*
f + g*x)) + 2*c*e^4*(d*g + e*(f + 2*g*x)) - c^3*e^2*(15*d^3*g - 4*e^3*f*x^2
 + 5*d^2*e*(f + 7*g*x) + d*e^2*x*(-3*f + 16*g*x))))/((-(c^2*d^2) + e^2)^3*(
d + e*x)^3) - (2*b*(3*e*f + d*g + 4*e*g*x)*ArcSin[c*x])/(d + e*x)^4 + (b*c^
3*(4*e^4*g - 2*c^4*d^3*(3*e*f + d*g) + c^2*d*e^2*(-9*e*f + 13*d*g))*Log[d +
 e*x])/((-(c*d) + e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*(-4*e^4
*g + c^2*d*e^2*(9*e*f - 13*d*g) + 2*c^4*d^3*(3*e*f + d*g))*Log[e + c^2*d*x
+ Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^3*(c*d + e)^3*Sq
rt[-(c^2*d^2) + e^2]))/(24*e^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1549 vs. $2(336) = 672$.

Time = 3.39 (sec) , antiderivative size = 1550, normalized size of antiderivative = 4.31

method	result	size
parts	Expression too large to display	1550
derivativedivides	Expression too large to display	1554
default	Expression too large to display	1554

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/4*(-d*g+e*f)/e^2/(e*x+d)^4-1/3*g/e^2/(e*x+d)^3)+b/c*(1/4*c^5*arcsin(c
*x)/e^2/(c*e*x+c*d)^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*f-1/3*c^4*arc
sin(c*x)*g/e^2/(c*e*x+c*d)^3+1/12*c^4/e^2*(4*g/e^3*(1/2/(c^2*d^2-e^2)*e^2/(
c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3
/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d
*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^
2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2
)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/
(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*
d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)
```

```
^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-3*c*(d*g-e*f
)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2
/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)
+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2
*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-
e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e
^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)
)/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^
2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/
e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-2/3/(c^2*d
^2-e^2)*e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d
*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/
2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2
)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)
)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1407 vs. $2(334) = 668$.

Time = 64.66 (sec) , antiderivative size = 2839, normalized size of antiderivative = 7.89

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Too large to display}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

```
[Out] [-1/48*(16*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*e
^7 + a*e^9)*g*x + ((3*(2*b*c^7*d^3*e^5 + 3*b*c^5*d*e^7)*f + (2*b*c^7*d^4*e^
4 - 13*b*c^5*d^2*e^6 - 4*b*c^3*e^8)*g)*x^4 + 4*(3*(2*b*c^7*d^4*e^4 + 3*b*c^
5*d^2*e^6)*f + (2*b*c^7*d^5*e^3 - 13*b*c^5*d^3*e^5 - 4*b*c^3*d*e^7)*g)*x^3
+ 6*(3*(2*b*c^7*d^5*e^3 + 3*b*c^5*d^3*e^5)*f + (2*b*c^7*d^6*e^2 - 13*b*c^5*
d^4*e^4 - 4*b*c^3*d^2*e^6)*g)*x^2 + 3*(2*b*c^7*d^7*e + 3*b*c^5*d^5*e^3)*f +
 (2*b*c^7*d^8 - 13*b*c^5*d^6*e^2 - 4*b*c^3*d^4*e^4)*g + 4*(3*(2*b*c^7*d^6*e
^2 + 3*b*c^5*d^4*e^4)*f + (2*b*c^7*d^7*e - 13*b*c^5*d^5*e^3 - 4*b*c^3*d^3*e
^5)*g)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^
2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^
2)/(e^2*x^2 + 2*d*e*x + d^2)) + 12*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4
*d^4*e^5 - 4*a*c^2*d^2*e^7 + a*e^9)*f + 4*(a*c^8*d^9 - 4*a*c^6*d^7*e^2 + 6*
a*c^4*d^5*e^4 - 4*a*c^2*d^3*e^6 + a*d*e^8)*g + 4*(4*(b*c^8*d^8*e - 4*b*c^6*
d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*g*x + 3*(b*c^8*d^8*e -
 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*f + (b*c^8*d^
9 - 4*b*c^6*d^7*e^2 + 6*b*c^4*d^5*e^4 - 4*b*c^2*d^3*e^6 + b*d*e^8)*g)*arcsi
n(c*x) - 2*sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^5 - 7*b*c^5*d^2*e^7 - 4*b*c
^3*e^9)*f + (b*c^7*d^5*e^4 - 17*b*c^5*d^3*e^6 + 16*b*c^3*d*e^8)*g)*x^3 + ((
```

38*b*c^7*d^5*e^4 - 31*b*c^5*d^3*e^6 - 7*b*c^3*d*e^8)*f + (2*b*c^7*d^6*e^3 - 53*b*c^5*d^4*e^5 + 55*b*c^3*d^2*e^7 - 4*b*c*e^9)*g)*x^2 + (18*b*c^7*d^7*e^2 - 23*b*c^5*d^5*e^4 + 7*b*c^3*d^3*e^6 - 2*b*c*d*e^8)*f - (2*b*c^7*d^8*e + 13*b*c^5*d^6*e^3 - 17*b*c^3*d^4*e^5 + 2*b*c*d^2*e^7)*g + ((45*b*c^7*d^6*e^3 - 47*b*c^5*d^4*e^5 + 4*b*c^3*d^2*e^7 - 2*b*c*e^9)*f - (b*c^7*d^7*e^2 + 49*b*c^5*d^5*e^4 - 56*b*c^3*d^3*e^6 + 6*b*c*d*e^8)*g)*x))/(c^8*d^12*e^2 - 4*c^6*d^10*e^4 + 6*c^4*d^8*e^6 - 4*c^2*d^6*e^8 + d^4*e^10 + (c^8*d^8*e^6 - 4*c^6*d^6*e^8 + 6*c^4*d^4*e^10 - 4*c^2*d^2*e^12 + e^14)*x^4 + 4*(c^8*d^9*e^5 - 4*c^6*d^7*e^7 + 6*c^4*d^5*e^9 - 4*c^2*d^3*e^11 + d*e^13)*x^3 + 6*(c^8*d^10*e^4 - 4*c^6*d^8*e^6 + 6*c^4*d^6*e^8 - 4*c^2*d^4*e^10 + d^2*e^12)*x^2 + 4*(c^8*d^11*e^3 - 4*c^6*d^9*e^5 + 6*c^4*d^7*e^7 - 4*c^2*d^5*e^9 + d^3*e^11)*x), -1/24*(8*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*e^7 + a*e^9)*g*x - ((3*(2*b*c^7*d^3*e^5 + 3*b*c^5*d*e^7)*f + (2*b*c^7*d^4*e^4 - 13*b*c^5*d^2*e^6 - 4*b*c^3*e^8)*g)*x^4 + 4*(3*(2*b*c^7*d^4*e^4 + 3*b*c^5*d^2*e^6)*f + (2*b*c^7*d^5*e^3 - 13*b*c^5*d^3*e^5 - 4*b*c^3*d*e^7)*g)*x^3 + 6*(3*(2*b*c^7*d^5*e^3 + 3*b*c^5*d^3*e^5)*f + (2*b*c^7*d^6*e^2 - 13*b*c^5*d^4*e^4 - 4*b*c^3*d^2*e^6)*g)*x^2 + 3*(2*b*c^7*d^7*e + 3*b*c^5*d^5*e^3)*f + (2*b*c^7*d^8 - 13*b*c^5*d^6*e^2 - 4*b*c^3*d^4*e^4)*g + 4*(3*(2*b*c^7*d^6*e^2 + 3*b*c^5*d^4*e^4)*f + (2*b*c^7*d^7*e - 13*b*c^5*d^5*e^3 - 4*b*c^3*d^3*e^5)*g)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + 6*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*e^7 + a*e^9)*f + 2*(a*c^8*d^9 - 4*a*c^6*d^7*e^2 + 6*a*c^4*d^5*e^4 - 4*a*c^2*d^3*e^6 + a*d*e^8)*g + 2*(4*(b*c^8*d^8*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*g*x + 3*(b*c^8*d^8*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*f + (b*c^8*d^9 - 4*b*c^6*d^7*e^2 + 6*b*c^4*d^5*e^4 - 4*b*c^2*d^3*e^6 + b*d*e^8)*g)*arcsin(c*x) - sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^5 - 7*b*c^5*d^2*e^7 - 4*b*c^3*e^9)*f + (b*c^7*d^5*e^4 - 17*b*c^5*d^3*e^6 + 16*b*c^3*d*e^8)*g)*x^3 + ((38*b*c^7*d^5*e^4 - 31*b*c^5*d^3*e^6 - 7*b*c^3*d*e^8)*f + (2*b*c^7*d^6*e^3 - 53*b*c^5*d^4*e^5 + 55*b*c^3*d^2*e^7 - 4*b*c*e^9)*g)*x^2 + (18*b*c^7*d^7*e^2 - 23*b*c^5*d^5*e^4 + 7*b*c^3*d^3*e^6 - 2*b*c*d*e^8)*f - (2*b*c^7*d^8*e + 13*b*c^5*d^6*e^3 - 17*b*c^3*d^4*e^5 + 2*b*c*d^2*e^7)*g + ((45*b*c^7*d^6*e^3 - 47*b*c^5*d^4*e^5 + 4*b*c^3*d^2*e^7 - 2*b*c*e^9)*f - (b*c^7*d^7*e^2 + 49*b*c^5*d^5*e^4 - 56*b*c^3*d^3*e^6 + 6*b*c*d*e^8)*g)*x))/(c^8*d^12*e^2 - 4*c^6*d^10*e^4 + 6*c^4*d^8*e^6 - 4*c^2*d^6*e^8 + d^4*e^10 + (c^8*d^8*e^6 - 4*c^6*d^6*e^8 + 6*c^4*d^4*e^10 - 4*c^2*d^2*e^12 + e^14)*x^4 + 4*(c^8*d^9*e^5 - 4*c^6*d^7*e^7 + 6*c^4*d^5*e^9 - 4*c^2*d^3*e^11 + d*e^13)*x^3 + 6*(c^8*d^10*e^4 - 4*c^6*d^8*e^6 + 6*c^4*d^6*e^8 - 4*c^2*d^4*e^10 + d^2*e^12)*x^2 + 4*(c^8*d^11*e^3 - 4*c^6*d^9*e^5 + 6*c^4*d^7*e^7 - 4*c^2*d^5*e^9 + d^3*e^11)*x)]

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^5}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**5, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

```
[Out] -1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
+ d^4*e^2) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3 + 6*d^2*e^3*x^2 + 4*d^3*e^2*x +
 d^4*e) - 1/12*((4*b*e*g*x + 3*b*e*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + 12*(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x + d
^4*e^2)*integrate(1/12*(4*b*c*e*g*x + 3*b*c*e*f + b*c*d*g)*e^(1/2*log(c*x +
 1) + 1/2*log(-c*x + 1))/(c^4*e^6*x^8 + 4*c^4*d*e^5*x^7 - 4*c^2*d^3*e^3*x^3
 - c^2*d^4*e^2*x^2 + (6*c^4*d^2*e^4 - c^2*e^6)*x^6 + 4*(c^4*d^3*e^3 - c^2*d
*e^5)*x^5 + (c^4*d^4*e^2 - 6*c^2*d^2*e^4)*x^4 + (c^2*e^6*x^6 + 4*c^2*d*e^5*
x^5 - 4*d^3*e^3*x - d^4*e^2 + (6*c^2*d^2*e^4 - e^6)*x^4 + 4*(c^2*d^3*e^3 -
d*e^5)*x^3 + (c^2*d^4*e^2 - 6*d^2*e^4)*x^2)*e^(log(c*x + 1) + log(-c*x + 1)
)), x))/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x + d^4*e^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{(d+e\,x)}^5}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5,x)
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5, x)
```

3.96 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 457

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx &= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e\left(c^2d^2-e^2\right)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e\left(c^2d^2-e^2\right)^2(d+ex)^3} \\ &+ \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e\left(c^2d^2-e^2\right)^3(d+ex)^2} \\ &- \frac{bc^3(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^4(d+ex)} \\ &- \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} \\ &+ \frac{bc^5(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{40e^2\left(c^2d^2-e^2\right)^{9/2}}\end{aligned}$$

```
[Out] -1/5*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^5-1/4*g*(a+b*arcsin(c*x))/e^2
/(e*x+d)^4+1/40*b*c^5*(c^2*d^2*e^2*(-19*d*g+24*e*f)+3*e^4*(-6*d*g+e*f)+2*c^
4*d^4*(d*g+4*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2
))/e^2/(c^2*d^2-e^2)^(9/2)+1/20*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^
2-e^2)/(e*x+d)^4-1/60*b*c*(5*e^2*g-c^2*d*(-2*d*g+7*e*f))*(-c^2*x^2+1)^(1/2)
/e/(c^2*d^2-e^2)^2/(e*x+d)^3+1/120*b*c^3*(e^2*(-34*d*g+9*e*f)+c^2*d^2*(-d*g
+26*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^3/(e*x+d)^2-1/24*b*c^3*(4*e^4*
g-c^2*d*e^2*(-18*d*g+11*e*f)-c^4*d^3*(d*g+10*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^
2*d^2-e^2)^4/(e*x+d)
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 457, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {45, 4837, 12, 849, 821, 739, 210}

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = -\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}+\frac{bc^5\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(2c^4d^4(dg+4ef)+c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg))}{40e^2(c^2d^2-e^2)^{9/2}}-\frac{bc\sqrt{1-c^2x^2}(5e^2g-c^2d(7ef-2dg))}{60e(c^2d^2-e^2)^2(d+ex)^3}+\frac{bc\sqrt{1-c^2x^2}(ef-dg)}{20e(c^2d^2-e^2)(d+ex)^4}+\frac{bc^3\sqrt{1-c^2x^2}(c^2d^2(26ef-dg)+e^2(9ef-34dg))}{120e(c^2d^2-e^2)^3(d+ex)^2}-\frac{bc^3\sqrt{1-c^2x^2}(c^4(-d^3)(dg+10ef)-c^2de^2(11ef-18dg)+4e^4g)}{24e(c^2d^2-e^2)^4(d+ex)}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

```
[Out] (b*c*(e*f - d*g)*Sqrt[1 - c^2*x^2])/(20*e*(c^2*d^2 - e^2)*(d + e*x)^4) - (b
*c*(5*e^2*g - c^2*d*(7*e*f - 2*d*g))*Sqrt[1 - c^2*x^2])/(60*e*(c^2*d^2 - e^
2)^2*(d + e*x)^3) + (b*c^3*(e^2*(9*e*f - 34*d*g) + c^2*d^2*(26*e*f - d*g))*
Sqrt[1 - c^2*x^2])/(120*e*(c^2*d^2 - e^2)^3*(d + e*x)^2) - (b*c^3*(4*e^4*g
- c^2*d*e^2*(11*e*f - 18*d*g) - c^4*d^3*(10*e*f + d*g))*Sqrt[1 - c^2*x^2])/
(24*e*(c^2*d^2 - e^2)^4*(d + e*x)) - ((e*f - d*g)*(a + b*ArcSin[c*x]))/(5*e
^2*(d + e*x)^5) - (g*(a + b*ArcSin[c*x]))/(4*e^2*(d + e*x)^4) + (b*c^5*(c^2
*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g) + 2*c^4*d^4*(4*e*f + d*g))
*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(40*e^2*(c^
2*d^2 - e^2)^(9/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$\text{integral} = -\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - (bc)\int \frac{-4ef-dg-5egx}{20e^2(d+ex)^5\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{(bc)\int \frac{-4ef-dg-5egx}{(d+ex)^5\sqrt{1-c^2x^2}}\,dx}{20e^2}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e(c^2d^2-e^2)(d+ex)^4} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{(bc)\int \frac{4(5e^2g-c^2d(4ef+dg))+12c^2e(ef-dg)x}{(d+ex)^4\sqrt{1-c^2x^2}}\,dx}{80e^2(c^2d^2-e^2)}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e(c^2d^2-e^2)^2(d+ex)^3} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{(bc)\int \frac{-12c^2(e^2(3ef-8dg)+c^2d^2(4ef+dg))-8c^2e(5e^2g-c^2d(7ef-2dg))x}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{240e^2(c^2d^2-e^2)^2}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e(c^2d^2-e^2)^3(d+ex)^2} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{(bc)\int \frac{8c^2(10e^4g-c^2de^2(23ef-28dg)-3c^4d^3(4ef+dg))+4c^4e(e^2(9ef-34dg)+c^2d^2(26ef-dg))x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{480e^2(c^2d^2-e^2)^3}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e(c^2d^2-e^2)^3(d+ex)^2} - \frac{bc^3(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} + \frac{(bc^5(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{40e^2(c^2d^2-e^2)^4}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e\left(c^2d^2-e^2\right)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e\left(c^2d^2-e^2\right)^2(d+ex)^3} + \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e\left(c^2d^2-e^2\right)^3(d+ex)^2} - \frac{bc^3(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^4(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{(bc^5(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg)))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2 \ldots}{\sqrt{1-\ldots}}\right)}{40e^2\left(c^2d^2-e^2\right)^4}$$

$$= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e\left(c^2d^2-e^2\right)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e\left(c^2d^2-e^2\right)^2(d+ex)^3} + \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e\left(c^2d^2-e^2\right)^3(d+ex)^2} - \frac{bc^3(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^4(d+ex)} - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} + \frac{bc^5(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{40e^2\left(c^2d^2-e^2\right)^{9/2}}$$

Mathematica [A] (verified)

Time = 1.31 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.08

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$$

$$= \frac{\frac{3a(-8ef+8dg)}{(d+ex)^5} - \frac{30ag}{(d+ex)^4} + \frac{bce\sqrt{1-c^2x^2}\left(-6\left(-c^2d^2+e^2\right)^3(ef-dg)-2\left(-c^2d^2+e^2\right)^2(5e^2g+c^2d(-7ef+2dg))(d+ex)-c^2\left(c^2d^2-e^2\right)\left(c^2d^2(- \ldots\right.\right.}{\left(-c^2d^2+e^2\right)^4(d+ \ldots}}{\ldots}$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

```
[Out] ((3*a*(-8*e*f + 8*d*g))/(d + e*x)^5 - (30*a*g)/(d + e*x)^4 + (b*c*e*Sqrt[1
- c^2*x^2]*(-6*(-(c^2*d^2) + e^2)^3*(e*f - d*g) - 2*(-(c^2*d^2) + e^2)^2*(5
*e^2*g + c^2*d*(-7*e*f + 2*d*g))*(d + e*x) - c^2*(c^2*d^2 - e^2)*(c^2*d^2*(
-26*e*f + d*g) + e^2*(-9*e*f + 34*d*g))*(d + e*x)^2 + 5*c^2*(-4*e^4*g + c^2
*d*e^2*(11*e*f - 18*d*g) + c^4*d^3*(10*e*f + d*g))*(d + e*x)^3))/((-(c^2*d^
2) + e^2)^4*(d + e*x)^4) - (6*b*(4*e*f + d*g + 5*e*g*x)*ArcSin[c*x])/(d + e
*x)^5 + (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g) + 2*c
```

```
^4*d^4*(4*e*f + d*g))*Log[d + e*x])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*
d^2) + e^2]) - (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g
) + 2*c^4*d^4*(4*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[
1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2]))/(120*e^
2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2405 vs. 2(429) = 858.

Time = 3.40 (sec) , antiderivative size = 2406, normalized size of antiderivative = 5.26

method	result	size
parts	Expression too large to display	2406
derivativedivides	Expression too large to display	2420
default	Expression too large to display	2420

```
[In] int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/4*g/e^2/(e*x+d)^4-1/5*(-d*g+e*f)/e^2/(e*x+d)^5)-1/4*b*c^4*arcsin(c*x)
*g/e^2/(c*e*x+c*d)^4+1/5*b*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^5*d*g-1/5*b*c^5*
arcsin(c*x)/e/(c*e*x+c*d)^5*f+1/12*b*c^4/e^4*g/(c^2*d^2-e^2)/(c*x+d*c/e)^3*
(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+17/60*b*c^5/e^
3*g*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^
2*d^2-e^2)/e^2)^(1/2)+13/12*b*c^6/e^2*g*d^2/(c^2*d^2-e^2)^3/(c*x+d*c/e)*(-(
c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-11/8*b*c^7/e^3*g*
d^3/(c^2*d^2-e^2)^3/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d
*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+
d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))+9/20*b*c^5/e^3*g*d/(c^2*d^2-e
^2)^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/
e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^
2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-1/6*b*c^4/e^2*g/(c^2*d^2-e^2)^2/(c*x+d*c/e)
*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-1/20*b*c^5/e^
5/(c^2*d^2-e^2)/(c*x+d*c/e)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-
e^2)/e^2)^(1/2)*d*g+1/20*b*c^5/e^4/(c^2*d^2-e^2)/(c*x+d*c/e)^4*(-(c*x+d*c/e
)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/60*b*c^6/e^4*d^2/(c^2*
d^2-e^2)^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/
e^2)^(1/2)*g+7/60*b*c^6/e^3*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2
+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/24*b*c^7/e^3*d^3/(c^2*d^2
-e^2)^3/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2
)^(1/2)*g+7/24*b*c^7/e^2*d^2/(c^2*d^2-e^2)^3/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+
2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/8*b*c^8/e^2*d^4/(c^2*d^2-e
^2)^4/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1
/2)*g+7/8*b*c^8/e*d^3/(c^2*d^2-e^2)^4/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(
c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f+7/8*b*c^9/e^3*d^5/(c^2*d^2-e^2)^4/(-(
```

```
c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c
^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^
2)^(1/2))/(c*x+d*c/e))*g-7/8*b*c^9/e^2*d^4/(c^2*d^2-e^2)^4/(-(c^2*d^2-e^2)/
e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e
^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e))*f+3/4*b*c^7/e^2*d^2/(c^2*d^2-e^2)^3/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln
((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(
c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))*f-1
1/24*b*c^6/e*d/(c^2*d^2-e^2)^3/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-3/40*b*c^5/e^2/(c^2*d^2-e^2)^2/(c*x+d*c/e)^2
*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-3/40*b*c^5/
e^2/(c^2*d^2-e^2)^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d
*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+
d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))*f
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1939 vs. $2(426) = 852$.

Time = 175.63 (sec) , antiderivative size = 3904, normalized size of antiderivative = 8.54

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Too large to display}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
```

```
[Out] [-1/240*(60*(a*c^10*d^10*e - 5*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^4*
d^4*e^7 + 5*a*c^2*d^2*e^9 - a*e^11)*g*x - 3*(((8*b*c^9*d^4*e^6 + 24*b*c^7*d
^2*e^8 + 3*b*c^5*e^10)*f + (2*b*c^9*d^5*e^5 - 19*b*c^7*d^3*e^7 - 18*b*c^5*d
*e^9)*g)*x^5 + 5*((8*b*c^9*d^5*e^5 + 24*b*c^7*d^3*e^7 + 3*b*c^5*d*e^9)*f +
(2*b*c^9*d^6*e^4 - 19*b*c^7*d^4*e^6 - 18*b*c^5*d^2*e^8)*g)*x^4 + 10*((8*b*c
^9*d^6*e^4 + 24*b*c^7*d^4*e^6 + 3*b*c^5*d^2*e^8)*f + (2*b*c^9*d^7*e^3 - 19*
b*c^7*d^5*e^5 - 18*b*c^5*d^3*e^7)*g)*x^3 + 10*((8*b*c^9*d^7*e^3 + 24*b*c^7*
d^5*e^5 + 3*b*c^5*d^3*e^7)*f + (2*b*c^9*d^8*e^2 - 19*b*c^7*d^6*e^4 - 18*b*c
^5*d^4*e^6)*g)*x^2 + (8*b*c^9*d^9*e + 24*b*c^7*d^7*e^3 + 3*b*c^5*d^5*e^5)*f
 + (2*b*c^9*d^10 - 19*b*c^7*d^8*e^2 - 18*b*c^5*d^6*e^4)*g + 5*((8*b*c^9*d^8
*e^2 + 24*b*c^7*d^6*e^4 + 3*b*c^5*d^4*e^6)*f + (2*b*c^9*d^9*e - 19*b*c^7*d^
7*e^3 - 18*b*c^5*d^5*e^5)*g)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2
*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqr
t(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 48*(a*c^10*d^10*e - 5
*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^4*d^4*e^7 + 5*a*c^2*d^2*e^9 - a*
e^11)*f + 12*(a*c^10*d^11 - 5*a*c^8*d^9*e^2 + 10*a*c^6*d^7*e^4 - 10*a*c^4*d
^5*e^6 + 5*a*c^2*d^3*e^8 - a*d*e^10)*g + 12*(5*(b*c^10*d^10*e - 5*b*c^8*d^8
*e^3 + 10*b*c^6*d^6*e^5 - 10*b*c^4*d^4*e^7 + 5*b*c^2*d^2*e^9 - b*e^11)*g*x
+ 4*(b*c^10*d^10*e - 5*b*c^8*d^8*e^3 + 10*b*c^6*d^6*e^5 - 10*b*c^4*d^4*e^7
+ 5*b*c^2*d^2*e^9 - b*e^11)*f + (b*c^10*d^11 - 5*b*c^8*d^9*e^2 + 10*b*c^6*d
```

^7*e^4 - 10*b*c^4*d^5*e^6 + 5*b*c^2*d^3*e^8 - b*d*e^10)*g)*arcsin(c*x) - 2*
(5*((10*b*c^9*d^5*e^6 + b*c^7*d^3*e^8 - 11*b*c^5*d*e^10)*f + (b*c^9*d^6*e^5
 - 19*b*c^7*d^4*e^7 + 14*b*c^5*d^2*e^9 + 4*b*c^3*e^11)*g)*x^4 + ((226*b*c^9
*d^6*e^5 - 23*b*c^7*d^4*e^7 - 212*b*c^5*d^2*e^9 + 9*b*c^3*e^11)*f + (19*b*c
^9*d^7*e^4 - 412*b*c^7*d^5*e^6 + 347*b*c^5*d^3*e^8 + 46*b*c^3*d*e^10)*g)*x^
3 + ((392*b*c^9*d^7*e^4 - 141*b*c^7*d^5*e^6 - 264*b*c^5*d^3*e^8 + 13*b*c^3*
d*e^10)*f + (23*b*c^9*d^8*e^3 - 664*b*c^7*d^6*e^5 + 639*b*c^5*d^4*e^7 - 8*b
*c^3*d^2*e^9 + 10*b*c*e^11)*g)*x^2 + (96*b*c^9*d^9*e^2 - 104*b*c^7*d^7*e^4
+ 31*b*c^5*d^5*e^6 - 29*b*c^3*d^3*e^8 + 6*b*c*d*e^10)*f - (6*b*c^9*d^10*e +
 101*b*c^7*d^8*e^3 - 119*b*c^5*d^6*e^5 + 16*b*c^3*d^4*e^7 - 4*b*c*d^2*e^9)*
g + ((312*b*c^9*d^8*e^3 - 217*b*c^7*d^6*e^5 - 76*b*c^5*d^4*e^7 - 25*b*c^3*d
^2*e^9 + 6*b*c*e^11)*f + (3*b*c^9*d^9*e^2 - 448*b*c^7*d^7*e^4 + 481*b*c^5*d
^5*e^6 - 50*b*c^3*d^3*e^8 + 14*b*c*d*e^10)*g)*x)*sqrt(-c^2*x^2 + 1))/(c^10*
d^15*e^2 - 5*c^8*d^13*e^4 + 10*c^6*d^11*e^6 - 10*c^4*d^9*e^8 + 5*c^2*d^7*e^
10 - d^5*e^12 + (c^10*d^10*e^7 - 5*c^8*d^8*e^9 + 10*c^6*d^6*e^11 - 10*c^4*d
^4*e^13 + 5*c^2*d^2*e^15 - e^17)*x^5 + 5*(c^10*d^11*e^6 - 5*c^8*d^9*e^8 + 1
0*c^6*d^7*e^10 - 10*c^4*d^5*e^12 + 5*c^2*d^3*e^14 - d*e^16)*x^4 + 10*(c^10*
d^12*e^5 - 5*c^8*d^10*e^7 + 10*c^6*d^8*e^9 - 10*c^4*d^6*e^11 + 5*c^2*d^4*e^
13 - d^2*e^15)*x^3 + 10*(c^10*d^13*e^4 - 5*c^8*d^11*e^6 + 10*c^6*d^9*e^8 -
10*c^4*d^7*e^10 + 5*c^2*d^5*e^12 - d^3*e^14)*x^2 + 5*(c^10*d^14*e^3 - 5*c^8
*d^12*e^5 + 10*c^6*d^10*e^7 - 10*c^4*d^8*e^9 + 5*c^2*d^6*e^11 - d^4*e^13)*x
), -1/120*(30*(a*c^10*d^10*e - 5*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^
4*d^4*e^7 + 5*a*c^2*d^2*e^9 - a*e^11)*g*x - 3*(((8*b*c^9*d^4*e^6 + 24*b*c^7
*d^2*e^8 + 3*b*c^5*e^10)*f + (2*b*c^9*d^5*e^5 - 19*b*c^7*d^3*e^7 - 18*b*c^5
*d*e^9)*g)*x^5 + 5*((8*b*c^9*d^5*e^5 + 24*b*c^7*d^3*e^7 + 3*b*c^5*d*e^9)*f
+ (2*b*c^9*d^6*e^4 - 19*b*c^7*d^4*e^6 - 18*b*c^5*d^2*e^8)*g)*x^4 + 10*((8*b
*c^9*d^6*e^4 + 24*b*c^7*d^4*e^6 + 3*b*c^5*d^2*e^8)*f + (2*b*c^9*d^7*e^3 - 1
9*b*c^7*d^5*e^5 - 18*b*c^5*d^3*e^7)*g)*x^3 + 10*((8*b*c^9*d^7*e^3 + 24*b*c^
7*d^5*e^5 + 3*b*c^5*d^3*e^7)*f + (2*b*c^9*d^8*e^2 - 19*b*c^7*d^6*e^4 - 18*b
*c^5*d^4*e^6)*g)*x^2 + (8*b*c^9*d^9*e + 24*b*c^7*d^7*e^3 + 3*b*c^5*d^5*e^5)
*f + (2*b*c^9*d^10 - 19*b*c^7*d^8*e^2 - 18*b*c^5*d^6*e^4)*g + 5*((8*b*c^9*d
^8*e^2 + 24*b*c^7*d^6*e^4 + 3*b*c^5*d^4*e^6)*f + (2*b*c^9*d^9*e - 19*b*c^7*
d^7*e^3 - 18*b*c^5*d^5*e^5)*g)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 -
 e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 -
 e^2)) + 24*(a*c^10*d^10*e - 5*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^4*
d^4*e^7 + 5*a*c^2*d^2*e^9 - a*e^11)*f + 6*(a*c^10*d^11 - 5*a*c^8*d^9*e^2 +
10*a*c^6*d^7*e^4 - 10*a*c^4*d^5*e^6 + 5*a*c^2*d^3*e^8 - a*d*e^10)*g + 6*(5*
(b*c^10*d^10*e - 5*b*c^8*d^8*e^3 + 10*b*c^6*d^6*e^5 - 10*b*c^4*d^4*e^7 + 5*
b*c^2*d^2*e^9 - b*e^11)*g*x + 4*(b*c^10*d^10*e - 5*b*c^8*d^8*e^3 + 10*b*c^6
*d^6*e^5 - 10*b*c^4*d^4*e^7 + 5*b*c^2*d^2*e^9 - b*e^11)*f + (b*c^10*d^11 -
5*b*c^8*d^9*e^2 + 10*b*c^6*d^7*e^4 - 10*b*c^4*d^5*e^6 + 5*b*c^2*d^3*e^8 - b
*d*e^10)*g)*arcsin(c*x) - (5*((10*b*c^9*d^5*e^6 + b*c^7*d^3*e^8 - 11*b*c^5*
d*e^10)*f + (b*c^9*d^6*e^5 - 19*b*c^7*d^4*e^7 + 14*b*c^5*d^2*e^9 + 4*b*c^3*
e^11)*g)*x^4 + ((226*b*c^9*d^6*e^5 - 23*b*c^7*d^4*e^7 - 212*b*c^5*d^2*e^9 +
 9*b*c^3*e^11)*f + (19*b*c^9*d^7*e^4 - 412*b*c^7*d^5*e^6 + 347*b*c^5*d^3*e^

```
8 + 46*b*c^3*d*e^10)*g)*x^3 + ((392*b*c^9*d^7*e^4 - 141*b*c^7*d^5*e^6 - 264
*b*c^5*d^3*e^8 + 13*b*c^3*d*e^10)*f + (23*b*c^9*d^8*e^3 - 664*b*c^7*d^6*e^5
 + 639*b*c^5*d^4*e^7 - 8*b*c^3*d^2*e^9 + 10*b*c*e^11)*g)*x^2 + (96*b*c^9*d^
9*e^2 - 104*b*c^7*d^7*e^4 + 31*b*c^5*d^5*e^6 - 29*b*c^3*d^3*e^8 + 6*b*c*d*e
^10)*f - (6*b*c^9*d^10*e + 101*b*c^7*d^8*e^3 - 119*b*c^5*d^6*e^5 + 16*b*c^3
*d^4*e^7 - 4*b*c*d^2*e^9)*g + ((312*b*c^9*d^8*e^3 - 217*b*c^7*d^6*e^5 - 76*
b*c^5*d^4*e^7 - 25*b*c^3*d^2*e^9 + 6*b*c*e^11)*f + (3*b*c^9*d^9*e^2 - 448*b
*c^7*d^7*e^4 + 481*b*c^5*d^5*e^6 - 50*b*c^3*d^3*e^8 + 14*b*c*d*e^10)*g)*x)*
sqrt(-c^2*x^2 + 1))/(c^10*d^15*e^2 - 5*c^8*d^13*e^4 + 10*c^6*d^11*e^6 - 10*
c^4*d^9*e^8 + 5*c^2*d^7*e^10 - d^5*e^12 + (c^10*d^10*e^7 - 5*c^8*d^8*e^9 +
10*c^6*d^6*e^11 - 10*c^4*d^4*e^13 + 5*c^2*d^2*e^15 - e^17)*x^5 + 5*(c^10*d^
11*e^6 - 5*c^8*d^9*e^8 + 10*c^6*d^7*e^10 - 10*c^4*d^5*e^12 + 5*c^2*d^3*e^14
 - d*e^16)*x^4 + 10*(c^10*d^12*e^5 - 5*c^8*d^10*e^7 + 10*c^6*d^8*e^9 - 10*c
^4*d^6*e^11 + 5*c^2*d^4*e^13 - d^2*e^15)*x^3 + 10*(c^10*d^13*e^4 - 5*c^8*d^
11*e^6 + 10*c^6*d^9*e^8 - 10*c^4*d^7*e^10 + 5*c^2*d^5*e^12 - d^3*e^14)*x^2
+ 5*(c^10*d^14*e^3 - 5*c^8*d^12*e^5 + 10*c^6*d^10*e^7 - 10*c^4*d^8*e^9 + 5*
c^2*d^6*e^11 - d^4*e^13)*x)]
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)}{(d+ex)^6}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**6, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
[Out] -1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*
x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^4*
x^3 + 10*d^3*e^3*x^2 + 5*d^4*e^2*x + d^5*e) - 1/20*((5*b*e*g*x + 4*b*e*f +
b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 20*(e^7*x^5 + 5*d*e^6*x
^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x + d^5*e^2)*integrate(1/2
0*(5*b*c*e*g*x + 4*b*c*e*f + b*c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
1))/(c^4*e^7*x^9 + 5*c^4*d*e^6*x^8 - 5*c^2*d^4*e^3*x^3 - c^2*d^5*e^2*x^2 +
(10*c^4*d^2*e^5 - c^2*e^7)*x^7 + 5*(2*c^4*d^3*e^4 - c^2*d*e^6)*x^6 + 5*(c^4
```

```
*d^4*e^3 - 2*c^2*d^2*e^5)*x^5 + (c^4*d^5*e^2 - 10*c^2*d^3*e^4)*x^4 + (c^2*e
^7*x^7 + 5*c^2*d*e^6*x^6 - 5*d^4*e^3*x - d^5*e^2 + (10*c^2*d^2*e^5 - e^7)*x
^5 + 5*(2*c^2*d^3*e^4 - d*e^6)*x^4 + 5*(c^2*d^4*e^3 - 2*d^2*e^5)*x^3 + (c^2
*d^5*e^2 - 10*d^3*e^4)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^7*x^5
 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x + d^5*e^2)
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^6}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6,x)
[Out] int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6, x)
```

3.97 $\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 26, antiderivative size = 512

$$\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(12e^2(eg+3dh)+25c^2d(3e^2f+3deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3} \\
&\quad + \frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&\quad + \frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} \\
&\quad + \frac{b(32(225c^4d^3f+24e^2(eg+3dh)+50c^2d(3e^2f+3deg+d^2h))+75(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e}{7200c^5} \\
&\quad - \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6} \\
&\quad + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx)) \\
&\quad + \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))
\end{aligned}$$

```
[Out] -1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2*h+3*d*e*g+e^2*f))*ar
csin(c*x)/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcsin
(c*x))+1/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(3*d^2*h+3
*d*e*g+e^2*f)*x^4*(a+b*arcsin(c*x))+1/5*e^2*(3*d*h+e*g)*x^5*(a+b*arcsin(c*x
))+1/6*e^3*h*x^6*(a+b*arcsin(c*x))+1/225*b*(12*e^2*(3*d*h+e*g)+25*c^2*d*(d^
2*h+3*d*e*g+3*e^2*f))*x^2*(-c^2*x^2+1)^(1/2)/c^3+1/144*b*e*(5*e^2*h+9*c^2*(
3*d^2*h+3*d*e*g+e^2*f))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/25*b*e^2*(3*d*h+e*g)*x
^4*(-c^2*x^2+1)^(1/2)/c+1/36*b*e^3*h*x^5*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(720
0*c^4*d^3*f+768*e^2*(3*d*h+e*g)+1600*c^2*d*(d^2*h+3*d*e*g+3*e^2*f)+75*(24*c
```

```
^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2*h+3*d*e*g+e^2*f))*x)*(-c^2*x^2+1)
^(1/2)/c^5
```

Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 509, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)^3\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)$$
$$+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))$$
$$+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$-\frac{b\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2e(3d^2h+3deg+e^2f)+5e^3h\right)}{96c^6}$$
$$+\frac{bex^3\sqrt{1-c^2x^2}\left(e^2\left(\frac{5h}{c^2}+9f\right)+27d^2h+27deg\right)}{144c}+\frac{be^2x^4\sqrt{1-c^2x^2}(3dh+eg)}{25c}$$
$$+\frac{be^3hx^5\sqrt{1-c^2x^2}}{36c}+\frac{bx^2\sqrt{1-c^2x^2}(25c^2d(d^2h+3deg+3e^2f)+12e^2(3dh+eg))}{225c^3}$$
$$+\frac{b\sqrt{1-c^2x^2}(75x(24c^4d^2(dg+3ef)+9c^2e(3d^2h+3deg+e^2f)+5e^3h)+32(225c^4d^3f+50c^2d(d^2h+3d}{7200c^5}$$

```
[In] Int[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(12*e^2*(e*g + 3*d*h) + 25*c^2*d*(3*e^2*f + 3*d*e*g + d^2*h))*x^2*Sqrt[1
 - c^2*x^2])/(225*c^3) + (b*e*(27*d*e*g + 27*d^2*h + e^2*(9*f + (5*h)/c^2))
*x^3*Sqrt[1 - c^2*x^2])/(144*c) + (b*e^2*(e*g + 3*d*h)*x^4*Sqrt[1 - c^2*x^2
])/(25*c) + (b*e^3*h*x^5*Sqrt[1 - c^2*x^2])/(36*c) + (b*(32*(225*c^4*d^3*f
+ 24*e^2*(e*g + 3*d*h) + 50*c^2*d*(3*e^2*f + 3*d*e*g + d^2*h)) + 75*(24*c^4
*d^2*(3*e*f + d*g) + 5*e^3*h + 9*c^2*e*(e^2*f + 3*d*e*g + 3*d^2*h))*x)*Sqrt
[1 - c^2*x^2])/(7200*c^5) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^3*h + 9*c^2*
e*(e^2*f + 3*d*e*g + 3*d^2*h))*ArcSin[c*x])/(96*c^6) + d^3*f*x*(a + b*ArcSi
n[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + (d*(3*e^2*f + 3*d
*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*(e^2*f + 3*d*e*g + 3*d^2*h)*x
^4*(a + b*ArcSin[c*x]))/4 + (e^2*(e*g + 3*d*h)*x^5*(a + b*ArcSin[c*x]))/5 +
 (e^3*h*x^6*(a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\text{integral} = d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx)) - (bc)\int \frac{x(10d^3(6f+x(3g+2hx))+15d^2ex(6f+x(4g+3hx))+3de^2x^2(20f+3x(5g+4hx))+e^3x^3(}{60\sqrt{1-c^2x^2}}$$

$$= d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$- \frac{1}{60}(bc)\int \frac{x(10d^3(6f+x(3g+2hx))+15d^2ex(6f+x(4g+3hx))+3de^2x^2(20f+3x(5g+4hx)}{\sqrt{1-c^2x^2}}$$

$$= \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$+ \frac{b\int \frac{x\left(-360c^2d^3f-180c^2d^2(3ef+dg)x-120c^2d\left(3e^2f+3deg+d^2h\right)x^2-10e\left(5e^2h+9c^2\left(e^2f+3deg+3d^2h\right)\right)x^3-72c^2e^2(eg+3dh)x^4\right)}{\sqrt{1-c^2x^2}}\,d}{360c}$$

$$= \frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} + d^3fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$- \frac{b\int \frac{x\left(1800c^4d^3f+900c^4d^2(3ef+dg)x+24c^2\left(12e^2(eg+3dh)+25c^2d\left(3e^2f+3deg+d^2h\right)\right)x^2+50c^2e\left(5e^2h+9c^2\left(e^2f+3deg+3d^2h\right)\right)x^3\right)}{\sqrt{1-c^2x^2}}}{1800c^3}$$

$$= \frac{be\left(5e^2h+9c^2(e^2f+3deg+3d^2h)\right)x^3\sqrt{1-c^2x^2}}{144c^3}$$
$$+ \frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} + d^3fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$+ \frac{b\int \frac{x\left(-7200c^6d^3f-150c^2\left(24c^4d^2(3ef+dg)+5e^3h+9c^2e\left(e^2f+3deg+3d^2h\right)\right)x-96c^4\left(12e^2(eg+3dh)+25c^2d\left(3e^2f+3deg+d^2h\right)\right)x^2\right)}{\sqrt{1-c^2x^2}}}{7200c^5}$$

$$= \frac{b(12e^2(eg+3dh)+25c^2d(3e^2f+3deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+\frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3}$$
$$+\frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c}+\frac{be^3hx^5\sqrt{1-c^2x^2}}{36c}+d^3fx(a+b\arcsin(cx))$$
$$+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+\frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+\frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$-\frac{b\int\frac{x\left(96c^4\left(225c^4d^3f+24e^2(eg+3dh)+50c^2d\left(3e^2f+3deg+d^2h\right)\right)+450c^4\left(24c^4d^2(3ef+dg)+5e^3h+9c^2e\left(e^2f+3deg+3d^2h\right)\right)x\right)}{\sqrt{1-c^2x^2}}\,dx}{21600c^7}$$

$$= \frac{b(12e^2(eg+3dh)+25c^2d(3e^2f+3deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+\frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3}$$
$$+\frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c}+\frac{be^3hx^5\sqrt{1-c^2x^2}}{36c}$$
$$+\frac{b(32(225c^4d^3f+24e^2(eg+3dh)+50c^2d(3e^2f+3deg+d^2h))+75(24c^4d^2(3ef+dg)+5e^3h+}{7200c^5}$$
$$+d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))$$
$$+\frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+\frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+\frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$
$$-\frac{(b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h)))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5}$$

$$= \frac{b(12e^2(eg+3dh)+25c^2d(3e^2f+3deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+ \frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3}$$
$$+ \frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c}$$
$$+ \frac{b(32(225c^4d^3f+24e^2(eg+3dh)+50c^2d(3e^2f+3deg+d^2h))+75(24c^4d^2(3ef+dg)+5e^3h+}{7200c^5}$$
$$- \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6}$$
$$+ d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.90

$$\int (d+ex)^3\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = ad^3fx + \frac{1}{2}ad^2(3ef+dg)x^2$$
$$+ \frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3 + \frac{1}{4}ae\left(e^2f+3deg+3d^2h\right)x^4 + \frac{1}{5}ae^2(eg+3dh)x^5 + \frac{1}{6}ae^3hx^6$$
$$+ \frac{b\sqrt{1-c^2x^2}(3e^2(256eg+768dh+125ehx)+c^2(1600d^3h+75d^2e(64g+27hx)+e^3x(675f+384gx+25}{}$$
$$- \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6}$$
$$+ \frac{1}{60}bx\left(10d^3(6f+x(3g+2hx))+15d^2ex(6f+x(4g+3hx))+3de^2x^2(20f+3x(5g+4hx)) + e^3x^3(15f+2x(6g+5hx))\right)\arcsin(cx)$$

```
[In] Integrate[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)*
x^3)/3 + (a*e*(e^2*f + 3*d*e*g + 3*d^2*h)*x^4)/4 + (a*e^2*(e*g + 3*d*h)*x^5
)/5 + (a*e^3*h*x^6)/6 + (b*Sqrt[1 - c^2*x^2]*(3*e^2*(256*e*g + 768*d*h + 12
5*e*h*x) + c^2*(1600*d^3*h + 75*d^2*e*(64*g + 27*h*x) + e^3*x*(675*f + 384*
g*x + 250*h*x^2) + 3*d*e^2*(1600*f + 675*g*x + 384*h*x^2)) + 2*c^4*(100*d^3
*(36*f + x*(9*g + 4*h*x)) + 75*d^2*e*x*(36*f + x*(16*g + 9*h*x)) + 3*d*e^2*
x^2*(400*f + 9*x*(25*g + 16*h*x)) + e^3*x^3*(225*f + 4*x*(36*g + 25*h*x))))
)/(7200*c^5) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^3*h + 9*c^2*e*(e^2*f + 3*
```

```
d*e*g + 3*d^2*h))*ArcSin[c*x])/(96*c^6) + (b*x*(10*d^3*(6*f + x*(3*g + 2*h*
x)) + 15*d^2*e*x*(6*f + x*(4*g + 3*h*x)) + 3*d*e^2*x^2*(20*f + 3*x*(5*g + 4
*h*x)) + e^3*x^3*(15*f + 2*x*(6*g + 5*h*x)))*ArcSin[c*x])/60
```

Maple [A] (verified)

Time = 0.37 (sec) , antiderivative size = 633, normalized size of antiderivative = 1.24

method	result
parts	$a\left(\frac{e^3 h\,x^6}{6}+\frac{(3d\,e^2h+e^3g)x^5}{5}+\frac{(3d^2eh+3d\,e^2g+e^3f)x^4}{4}+\frac{(d^3h+3d^2eg+3d\,e^2f)x^3}{3}+\frac{(d^3g+3d^2ef)x^2}{2}+d^3f\right.$
derivativedivides	$\frac{a\left(\frac{e^3h\,c^6x^6}{6}+\frac{\left(3dc\,e^2h+e^3cg\right)c^5x^5}{5}+\frac{\left(3d^2c^2eh+3d\,c^2e^2g+e^3c^2f\right)c^4x^4}{4}+\frac{\left(c^3d^3h+3d^2c^3eg+3d\,c^3e^2f\right)c^3x^3}{3}+\frac{\left(c^4d^3g+3d^2c^4ef\right)c^2}{2}\right.}{c^5}$
default	$\frac{a\left(\frac{e^3h\,c^6x^6}{6}+\frac{\left(3dc\,e^2h+e^3cg\right)c^5x^5}{5}+\frac{\left(3d^2c^2eh+3d\,c^2e^2g+e^3c^2f\right)c^4x^4}{4}+\frac{\left(c^3d^3h+3d^2c^3eg+3d\,c^3e^2f\right)c^3x^3}{3}+\frac{\left(c^4d^3g+3d^2c^4ef\right)c^2}{2}\right.}{c^5}$

```
[In] int((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/6*e^3*h*x^6+1/5*(3*d*e^2*h+e^3*g)*x^5+1/4*(3*d^2*e*h+3*d*e^2*g+e^3*f)*
x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^2*f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+
b/c*(1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arcsin
(c*x)*e^3*g*x^5+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*x)*x^4*d*e^2*g
+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*arcsin(c*x)*x^3*
d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*arcsin(
c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^5*(10*e^3*h*(-1/6*c^5*x^5*(-c
^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)
+5/16*arcsin(c*x))-60*d^3*c^5*f*(-c^2*x^2+1)^(1/2)+(36*c*d*e^2*h+12*c*e^3*g
)*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c
^2*x^2+1)^(1/2))+(30*c^4*d^3*g+90*c^4*d^2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)
+1/2*arcsin(c*x))+(45*c^2*d^2*e*h+45*c^2*d*e^2*g+15*c^2*e^3*f)*(-1/4*c^3*x^
3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(20*c^3*d^
3*h+60*c^3*d^2*e*g+60*c^3*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c
^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 676, normalized size of antiderivative = 1.32

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \frac{1200\,ac^6e^3hx^6 + 7200\,ac^6d^3fx + 1440\,(ac^6e^3g + 3\,ac^6de^2h)x^5 + 1800\,(ac^6e^3f + 3\,ac^6de^2g + 3\,ac^6d^2eh)x^4 + \cdots}{\cdots}$$

[In] integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")

```
[Out] 1/7200*(1200*a*c^6*e^3*h*x^6 + 7200*a*c^6*d^3*f*x + 1440*(a*c^6*e^3*g + 3*a
*c^6*d*e^2*h)*x^5 + 1800*(a*c^6*e^3*f + 3*a*c^6*d*e^2*g + 3*a*c^6*d^2*e*h)*
x^4 + 2400*(3*a*c^6*d*e^2*f + 3*a*c^6*d^2*e*g + a*c^6*d^3*h)*x^3 + 3600*(3*
a*c^6*d^2*e*f + a*c^6*d^3*g)*x^2 + 15*(80*b*c^6*e^3*h*x^6 + 480*b*c^6*d^3*f
*x + 96*(b*c^6*e^3*g + 3*b*c^6*d*e^2*h)*x^5 + 120*(b*c^6*e^3*f + 3*b*c^6*d*
e^2*g + 3*b*c^6*d^2*e*h)*x^4 + 160*(3*b*c^6*d*e^2*f + 3*b*c^6*d^2*e*g + b*c
^6*d^3*h)*x^3 + 240*(3*b*c^6*d^2*e*f + b*c^6*d^3*g)*x^2 - 45*(8*b*c^4*d^2*e
 + b*c^2*e^3)*f - 15*(8*b*c^4*d^3 + 9*b*c^2*d*e^2)*g - 5*(27*b*c^2*d^2*e +
5*b*e^3)*h)*arcsin(c*x) + (200*b*c^5*e^3*h*x^5 + 288*(b*c^5*e^3*g + 3*b*c^5
*d*e^2*h)*x^4 + 50*(9*b*c^5*e^3*f + 27*b*c^5*d*e^2*g + (27*b*c^5*d^2*e + 5*
b*c^3*e^3)*h)*x^3 + 32*(75*b*c^5*d*e^2*f + 3*(25*b*c^5*d^2*e + 4*b*c^3*e^3)
*g + (25*b*c^5*d^3 + 36*b*c^3*d*e^2)*h)*x^2 + 2400*(3*b*c^5*d^3 + 2*b*c^3*d
*e^2)*f + 192*(25*b*c^3*d^2*e + 4*b*c*e^3)*g + 64*(25*b*c^3*d^3 + 36*b*c*d*
e^2)*h + 75*(9*(8*b*c^5*d^2*e + b*c^3*e^3)*f + 3*(8*b*c^5*d^3 + 9*b*c^3*d*e
^2)*g + (27*b*c^3*d^2*e + 5*b*c*e^3)*h)*x)*sqrt(-c^2*x^2 + 1))/c^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1263 vs. 2(505) = 1010.

Time = 0.67 (sec) , antiderivative size = 1263, normalized size of antiderivative = 2.47

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

[In] integrate((e*x+d)**3*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)

```
[Out] Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + 3*a*d**2*e*f*x*
*2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + a*d*e**2*f*x**3 + 3*a*d*e**2
*g*x**4/4 + 3*a*d*e**2*h*x**5/5 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*e**
3*h*x**6/6 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d**3*h*x*
*3*asin(c*x)/3 + 3*b*d**2*e*f*x**2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(c*x)
+ 3*b*d**2*e*h*x**4*asin(c*x)/4 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e**2*g*
x**4*asin(c*x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*e**3*f*x**4*asin(c*x)/
```

```
4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*asin(c*x)/6 + b*d**3*f*sqrt(-
c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*h*x**2*sq
rt(-c**2*x**2 + 1)/(9*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d*
*2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d**2*e*h*x**3*sqrt(-c**2*x**2
+ 1)/(16*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*g*x**
3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*
c) + b*e**3*f*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x
**2 + 1)/(25*c) + b*e**3*h*x**5*sqrt(-c**2*x**2 + 1)/(36*c) - b*d**3*g*asin
(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**3*h*sqrt(-c**2*x*
*2 + 1)/(9*c**3) + 2*b*d**2*e*g*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d**2*e*
h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 2*b*d*e**2*f*sqrt(-c**2*x**2 + 1)/(3*c
**3) + 9*b*d*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 4*b*d*e**2*h*x**2*sq
rt(-c**2*x**2 + 1)/(25*c**3) + 3*b*e**3*f*x*sqrt(-c**2*x**2 + 1)/(32*c**3)
+ 4*b*e**3*g*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 5*b*e**3*h*x**3*sqrt(-c*
*2*x**2 + 1)/(144*c**3) - 9*b*d**2*e*h*asin(c*x)/(32*c**4) - 9*b*d*e**2*g*a
sin(c*x)/(32*c**4) - 3*b*e**3*f*asin(c*x)/(32*c**4) + 8*b*d*e**2*h*sqrt(-c*
*2*x**2 + 1)/(25*c**5) + 8*b*e**3*g*sqrt(-c**2*x**2 + 1)/(75*c**5) + 5*b*e*
*3*h*x*sqrt(-c**2*x**2 + 1)/(96*c**5) - 5*b*e**3*h*asin(c*x)/(96*c**6), Ne(
c, 0)), (a*(d**3*f*x + d**3*g*x**2/2 + d**3*h*x**3/3 + 3*d**2*e*f*x**2/2 +
d**2*e*g*x**3 + 3*d**2*e*h*x**4/4 + d*e**2*f*x**3 + 3*d*e**2*g*x**4/4 + 3*d
*e**2*h*x**5/5 + e**3*f*x**4/4 + e**3*g*x**5/5 + e**3*h*x**6/6), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 859, normalized size of antiderivative = 1.68

$$
\begin{aligned}
\int (d+ex)^3 \left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx &= \frac{1}{6}\,ae^3hx^6 + \frac{1}{5}\,ae^3gx^5 + \frac{3}{5}\,ade^2hx^5 \\
&+ \frac{1}{4}\,ae^3fx^4 + \frac{3}{4}\,ade^2gx^4 + \frac{3}{4}\,ad^2ehx^4 + ade^2fx^3 + ad^2egx^3 + \frac{1}{3}\,ad^3hx^3 + \frac{3}{2}\,ad^2efx^2 \\
&+ \frac{1}{2}\,ad^3gx^2 + \frac{3}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2ef \\
&+ \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2f \\
&+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3f \\
&+ \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^3g \\
&+ \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2eg \\
&+ \frac{3}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde^2g \\
&+ \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3g \\
&+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3h \\
&+ \frac{3}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd^2eh \\
&+ \frac{1}{25}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bde^2h \\
&+ \frac{1}{288}\left(48\,x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)c\right. \\
&+ ad^3fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3f}{c}
\end{aligned}
$$

```
[In] integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 + 3
/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/3*
a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^3*ar
```

```
csin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*
e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c
^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*x^3*arcs
in(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*
e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2
*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5*arcsin(c*x
) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-
c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x^4*arcsin(c*x) +
 (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)
/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e^2*h
+ 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*
x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e
^3*h + a*d^3*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1337 vs. $2(477) = 954$.

Time = 0.34 (sec) , antiderivative size = 1337, normalized size of antiderivative = 2.61

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 + 3
/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/3*
a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*f*x
*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x^2
 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x/c + 1/
4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcsin(c*x)/c
^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*arcsin(c*x
)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*e^2*h*x*arc
sin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e
^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-c^2*x^2 + 1
)^(3/2)*b*d^2*e*h*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 -
1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*
f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e
^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*h*arcsin(c*x)/c^4 + 2/5*
(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d*e^2*h*x*arc
sin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*f/c^3 - 1/3*(-c^2*x^2 + 1)^
(3/2)*b*d^2*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^3*h/c^3 + 5/32*sqrt(-c^2
```

```
*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*g*x/c^3 + 15/32*
sqrt(-c^2*x^2 + 1)*b*d^2*e*h*x/c^3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b*e^3*h*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^3*f*arcsin(c*x)/c^4 + 3/2*(c^2*x^2
- 1)*b*d*e^2*g*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b*d^2*e*h*arcsin(c*x)/c^
4 + 1/6*(c^2*x^2 - 1)^3*b*e^3*h*arcsin(c*x)/c^6 + 1/5*b*e^3*g*x*arcsin(c*x)
/c^4 + 3/5*b*d*e^2*h*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*e^2*f/c^3 +
 sqrt(-c^2*x^2 + 1)*b*d^2*e*g/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)
*b*e^3*g/c^5 + 1/3*sqrt(-c^2*x^2 + 1)*b*d^3*h/c^3 + 3/25*(c^2*x^2 - 1)^2*sq
rt(-c^2*x^2 + 1)*b*d*e^2*h/c^5 - 13/144*(-c^2*x^2 + 1)^(3/2)*b*e^3*h*x/c^5
+ 5/32*b*e^3*f*arcsin(c*x)/c^4 + 15/32*b*d*e^2*g*arcsin(c*x)/c^4 + 15/32*b*
d^2*e*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e^3*h*arcsin(c*x)/c^6 - 2/1
5*(-c^2*x^2 + 1)^(3/2)*b*e^3*g/c^5 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*h/c^5
 + 11/96*sqrt(-c^2*x^2 + 1)*b*e^3*h*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^3*h*arcsi
n(c*x)/c^6 + 1/5*sqrt(-c^2*x^2 + 1)*b*e^3*g/c^5 + 3/5*sqrt(-c^2*x^2 + 1)*b*
d*e^2*h/c^5 + 11/96*b*e^3*h*arcsin(c*x)/c^6
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)^3\,\left(h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2),x)
[Out] int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2), x)
```

3.98 $\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 26, antiderivative size = 361

$$\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$$
$$= \frac{b(12e^2h+25c^2(e^2f+2deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c}$$
$$+ \frac{b(32(225c^4d^2f+24e^2h+50c^2(e^2f+2deg+d^2h))+225c^2(8c^2d(2ef+dg)+3e(eg+2dh))\,x)\sqrt{1-c^2x^2}}{7200c^5}$$
$$- \frac{b(8c^2d(2ef+dg)+3e(eg+2dh))\arcsin(cx)}{32c^4} + d^2fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(e^2f+2deg+d^2h)\,x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

```
[Out] -1/32*b*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))*arcsin(c*x)/c^4+d^2*f*x*(a+b*
arcsin(c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d^2*h+2*d*e*g+e^2
*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(2*d*h+e*g)*x^4*(a+b*arcsin(c*x))+1/5*e^2*h
*x^5*(a+b*arcsin(c*x))+1/225*b*(12*e^2*h+25*c^2*(d^2*h+2*d*e*g+e^2*f))*x^2*
(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e*(2*d*h+e*g)*x^3*(-c^2*x^2+1)^(1/2)/c+1/25*b
*e^2*h*x^4*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*c^4*d^2*f+768*e^2*h+1600*c^2
*(d^2*h+2*d*e*g+e^2*f)+225*c^2*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))*x)*(-c
^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right) + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx)) + \frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx)) - \frac{b\arcsin(cx)\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)}{32c^4} + \frac{bex^3\sqrt{1-c^2x^2}(2dh+eg)}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c} + \frac{bx^2\sqrt{1-c^2x^2}(25c^2(d^2h+2deg+e^2f)+12e^2h)}{225c^3} + \frac{b\sqrt{1-c^2x^2}(225c^2x(8c^2d(dg+2ef)+3e(2dh+eg))+32(225c^4d^2f+50c^2(d^2h+2deg+e^2f)+24e^2h))}{7200c^5}$$

```
[In] Int[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(12*e^2*h + 25*c^2*(e^2*f + 2*d*e*g + d^2*h))*x^2*Sqrt[1 - c^2*x^2])/(22
5*c^3) + (b*e*(e*g + 2*d*h)*x^3*Sqrt[1 - c^2*x^2])/(16*c) + (b*e^2*h*x^4*Sq
rt[1 - c^2*x^2])/(25*c) + (b*(32*(225*c^4*d^2*f + 24*e^2*h + 50*c^2*(e^2*f
+ 2*d*e*g + d^2*h)) + 225*c^2*(8*c^2*d*(2*e*f + d*g) + 3*e*(e*g + 2*d*h))*x
)*Sqrt[1 - c^2*x^2])/(7200*c^5) - (b*(8*c^2*d*(2*e*f + d*g) + 3*e*(e*g + 2*
d*h))*ArcSin[c*x])/(32*c^4) + d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g
)*x^2*(a + b*ArcSin[c*x]))/2 + ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin
[c*x]))/3 + (e*(e*g + 2*d*h)*x^4*(a + b*ArcSin[c*x]))/4 + (e^2*h*x^5*(a + b
*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
```

```
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x(60d^2f+30d(2ef+dg)x+20\left(e^2f+2deg+d^2h\right)x^2+15e(eg+2dh)x^3+12e^2hx^4)}{60\sqrt{1-c^2x^2}}\,dx \\
&= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx)) \\
&\quad-\frac{1}{60}(bc)\int\frac{x(60d^2f+30d(2ef+dg)x+20\left(e^2f+2deg+d^2h\right)x^2+15e(eg+2dh)x^3+12e^2hx^4}{\sqrt{1-c^2x^2}} \\
&= \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c}+d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx)) \\
&\quad+\frac{b\int\frac{x\left(-300c^2d^2f-150c^2d(2ef+dg)x-4\left(12e^2h+25c^2\left(e^2f+2deg+d^2h\right)\right)x^2-75c^2e(eg+2dh)x^3\right)}{\sqrt{1-c^2x^2}}\,dx}{300c}
\end{aligned}$$

$$= \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c} + d^2fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$
$$- \frac{b\int \frac{x\left(1200c^4d^2f+75c^2\left(8c^2d(2ef+dg)+3e(eg+2dh)\right)x+16c^2\left(12e^2h+25c^2\left(e^2f+2deg+d^2h\right)\right)x^2\right)}{\sqrt{1-c^2x^2}}dx}{1200c^3}$$

$$= \frac{b(12e^2h+25c^2(e^2f+2deg+d^2h))x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+ \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c} + d^2fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$
$$+ \frac{b\int \frac{x\left(-16c^2\left(225c^4d^2f+24e^2h+50c^2\left(e^2f+2deg+d^2h\right)\right)-225c^4\left(8c^2d(2ef+dg)+3e(eg+2dh)\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3600c^5}$$

$$= \frac{b(12e^2h+25c^2(e^2f+2deg+d^2h))x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+ \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c}$$
$$+ \frac{b(32(225c^4d^2f+24e^2h+50c^2(e^2f+2deg+d^2h))+225c^2(8c^2d(2ef+dg)+3e(eg+2dh))x)\surd}{7200c^5}$$
$$+ d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e^2hx^5(a+b\arcsin(cx)) - \frac{(b(8c^2d(2ef+dg)+3e(eg+2dh)))\int \frac{1}{\sqrt{1-c^2x^2}}dx}{32c^3}$$

$$= \frac{b(12e^2h+25c^2(e^2f+2deg+d^2h))x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+ \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^2hx^4\sqrt{1-c^2x^2}}{25c}$$
$$+ \frac{b(32(225c^4d^2f+24e^2h+50c^2(e^2f+2deg+d^2h))+225c^2(8c^2d(2ef+dg)+3e(eg+2dh))x)\surd}{7200c^5}$$
$$- \frac{b(8c^2d(2ef+dg)+3e(eg+2dh))\arcsin(cx)}{32c^4} + d^2fx(a+b\arcsin(cx))$$
$$+ \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.85

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$=\frac{120ac^5x(10d^2(6f+x(3g+2hx))+10dex(6f+x(4g+3hx))+e^2x^2(20f+3x(5g+4hx)))+b\sqrt{1-c^2x}}{}$$

[In] Integrate[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]

[Out] (120*a*c^5*x*(10*d^2*(6*f + x*(3*g + 2*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h*x))) + b*Sqrt[1 - c^2*x^2]*(768*e^2*h + c^2*(1600*d^2*h + 50*d*e*(64*g + 27*h*x) + e^2*(1600*f + 675*g*x + 384*h*x^2)) + 2*c^4*(100*d^2*(36*f + x*(9*g + 4*h*x)) + 50*d*e*x*(36*f + x*(16*g + 9*h*x)) + e^2*x^2*(400*f + 9*x*(25*g + 16*h*x)))) + 15*b*c*(-120*c^2*d*(2*e*f + d*g) - 45*e*(e*g + 2*d*h) + 8*c^4*x*(10*d^2*(6*f + x*(3*g + 2*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h*x))))*ArcSin[c*x])/(7200*c^5)

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.24

method	result
parts	$a\left(\frac{e^2hx^5}{5}+\frac{(2deh+e^2g)x^4}{4}+\frac{(d^2h+2deg+e^2f)x^3}{3}+\frac{(d^2g+2def)x^2}{2}+d^2fx\right)+\frac{b\left(\frac{c\arcsin(cx)e^2hx^5}{5}+\frac{c\arcsin}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{e^2hc^5x^5}{5}+\frac{(2dceh+e^2cg)c^4x^4}{4}+\frac{(c^2d^2h+2dc^2eg+e^2c^2f)c^3x^3}{3}+\frac{(c^3d^2g+2dc^3ef)c^2x^2}{2}+d^2c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^2hc^5x^5}{5}+\right.}{}$
default	$\frac{a\left(\frac{e^2hc^5x^5}{5}+\frac{(2dceh+e^2cg)c^4x^4}{4}+\frac{(c^2d^2h+2dc^2eg+e^2c^2f)c^3x^3}{3}+\frac{(c^3d^2g+2dc^3ef)c^2x^2}{2}+d^2c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^2hc^5x^5}{5}+\right.}{}$

[In] int((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/5*e^2*h*x^5+1/4*(2*d*e*h+e^2*g)*x^4+1/3*(d^2*h+2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/5*c*arcsin(c*x)*e^2*h*x^5+1/2*c*arcsin(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)*e^2*g*x^4+1/3*c*arcsin(c*x)*x^3*d^2*h+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(c*x)*d^2*f*c*x-1/60/c^4*(12*e^2*h*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-60*d^2*c^4*f*(-c^2*x^2+1)^(1/2)+(30*c*d*e*h+15*c*e^2*g)*(-1/4*c^3

```
*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(30*c^3
*d^2*g+60*c^3*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+(20*c^2*
d^2*h+40*c^2*d*e*g+20*c^2*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2
*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.24

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1440\,ac^5e^2hx^5 + 7200\,ac^5d^2fx + 1800\,(ac^5e^2g + 2\,ac^5deh)x^4 + 2400\,(ac^5e^2f + 2\,ac^5deg + ac^5d^2h)x^3 + 360}{}$$

```
[In] integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/7200*(1440*a*c^5*e^2*h*x^5 + 7200*a*c^5*d^2*f*x + 1800*(a*c^5*e^2*g + 2*a
*c^5*d*e*h)*x^4 + 2400*(a*c^5*e^2*f + 2*a*c^5*d*e*g + a*c^5*d^2*h)*x^3 + 36
00*(2*a*c^5*d*e*f + a*c^5*d^2*g)*x^2 + 15*(96*b*c^5*e^2*h*x^5 + 480*b*c^5*d
^2*f*x - 240*b*c^3*d*e*f - 90*b*c*d*e*h + 120*(b*c^5*e^2*g + 2*b*c^5*d*e*h)
*x^4 + 160*(b*c^5*e^2*f + 2*b*c^5*d*e*g + b*c^5*d^2*h)*x^3 + 240*(2*b*c^5*d
*e*f + b*c^5*d^2*g)*x^2 - 15*(8*b*c^3*d^2 + 3*b*c*e^2)*g)*arcsin(c*x) + (28
8*b*c^4*e^2*h*x^4 + 3200*b*c^2*d*e*g + 450*(b*c^4*e^2*g + 2*b*c^4*d*e*h)*x^
3 + 32*(25*b*c^4*e^2*f + 50*b*c^4*d*e*g + (25*b*c^4*d^2 + 12*b*c^2*e^2)*h)*
x^2 + 800*(9*b*c^4*d^2 + 2*b*c^2*e^2)*f + 64*(25*b*c^2*d^2 + 12*b*e^2)*h +
225*(16*b*c^4*d*e*f + 6*b*c^2*d*e*h + (8*b*c^4*d^2 + 3*b*c^2*e^2)*g)*x)*sqr
t(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 821 vs. 2(352) = 704.

Time = 0.51 (sec) , antiderivative size = 821, normalized size of antiderivative = 2.27

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2fx + \frac{ad^2gx^2}{2} + \frac{ad^2hx^3}{3} + adefx^2 + \frac{2adegx^3}{3} + \frac{adehx^4}{2} + \frac{ae^2fx^3}{3} + \frac{ae^2gx^4}{4} + \frac{ae^2hx^5}{5} + bd^2fx\operatorname{asin}(cx) + \frac{bd^2gx^2}{} \\ a\left(d^2fx + \frac{d^2gx^2}{2} + \frac{d^2hx^3}{3} + defx^2 + \frac{2degx^3}{3} + \frac{dehx^4}{2} + \frac{e^2fx^3}{3} + \frac{e^2gx^4}{4} + \frac{e^2hx^5}{5}\right) \end{cases}$$

```
[In] integrate((e*x+d)**2*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d*e*f*x**2 +
2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + a*e
```

```
**2*h*x**5/5 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2*h*
x**3*asin(c*x)/3 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3 + b*
d*e*h*x**4*asin(c*x)/2 + b*e**2*f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x
)/4 + b*e**2*h*x**5*asin(c*x)/5 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b*d**2*
g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) +
 b*d*e*f*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)
/(9*c) + b*d*e*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*f*x**2*sqrt(-c**2
*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**2*h*x**
4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(
c*x)/(2*c**2) + 2*b*d**2*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*d*e*g*sqrt(-
c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 2*b*
e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**2*x**2 + 1)/(3
2*c**3) + 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 3*b*d*e*h*asin(c
*x)/(16*c**4) - 3*b*e**2*g*asin(c*x)/(32*c**4) + 8*b*e**2*h*sqrt(-c**2*x**2
 + 1)/(75*c**5), Ne(c, 0)), (a*(d**2*f*x + d**2*g*x**2/2 + d**2*h*x**3/3 +
d*e*f*x**2 + 2*d*e*g*x**3/3 + d*e*h*x**4/2 + e**2*f*x**3/3 + e**2*g*x**4/4
+ e**2*h*x**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 581, normalized size of antiderivative = 1.61

$$\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}ae^2hx^5 + \frac{1}{4}ae^2gx^4 + \frac{1}{2}adehx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + \frac{1}{3}ad^2hx^3 + adefx^2$$
$$+ \frac{1}{2}ad^2gx^2 + \frac{1}{2}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef$$
$$+ \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f$$
$$+ \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g$$
$$+ \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg$$
$$+ \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g$$
$$+ \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2h$$
$$+ \frac{1}{16}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bdeh$$
$$+ \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2h$$
$$+ ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

```
[In] integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/3
*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x^2
*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f + 1/
9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)
/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arc
sin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2
/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x) + (2*sq
rt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*
c)*b*e^2*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqr
t(-c^2*x^2 + 1)/c^4))*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2
+ 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e*h +
 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2
```

```
 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + a*d^2*f*x + (c*x*arc
sin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 847 vs. $2(332) = 664$.

Time = 0.33 (sec) , antiderivative size = 847, normalized size of antiderivative = 2.35

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$\begin{aligned}
&= \frac{1}{5}\,ae^2hx^5 + \frac{1}{4}\,ae^2gx^4 + \frac{1}{2}\,adehx^4 + \frac{1}{3}\,ae^2fx^3 + \frac{2}{3}\,adegx^3 + \frac{1}{3}\,ad^2hx^3 + bd^2fx\arcsin(cx) \\
&+ ad^2fx + \frac{(c^2x^2-1)be^2fx\arcsin(cx)}{3\,c^2} + \frac{2\,(c^2x^2-1)bdegx\arcsin(cx)}{3\,c^2} \\
&+ \frac{(c^2x^2-1)bd^2hx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bdefx}{2\,c} + \frac{\sqrt{-c^2x^2+1}bd^2gx}{4\,c} \\
&+ \frac{(c^2x^2-1)bdef\arcsin(cx)}{c^2} + \frac{(c^2x^2-1)bd^2g\arcsin(cx)}{2\,c^2} + \frac{be^2fx\arcsin(cx)}{3\,c^2} \\
&+ \frac{2\,bdegx\arcsin(cx)}{3\,c^2} + \frac{bd^2hx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2be^2hx\arcsin(cx)}{5\,c^4} \\
&+ \frac{\sqrt{-c^2x^2+1}bd^2f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2gx}{16\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdehx}{8\,c^3} + \frac{(c^2x^2-1)adef}{c^2} \\
&+ \frac{(c^2x^2-1)ad^2g}{2\,c^2} + \frac{bdef\arcsin(cx)}{2\,c^2} + \frac{bd^2g\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2be^2g\arcsin(cx)}{4\,c^4} \\
&+ \frac{(c^2x^2-1)^2bdeh\arcsin(cx)}{2\,c^4} + \frac{2\,(c^2x^2-1)be^2hx\arcsin(cx)}{5\,c^4} \\
&- \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2f}{9\,c^3} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bdeg}{9\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2h}{9\,c^3} \\
&+ \frac{5\,\sqrt{-c^2x^2+1}be^2gx}{32\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}bdehx}{16\,c^3} + \frac{(c^2x^2-1)be^2g\arcsin(cx)}{2\,c^4} \\
&+ \frac{(c^2x^2-1)bdeh\arcsin(cx)}{c^4} + \frac{be^2hx\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}be^2f}{3\,c^3} \\
&+ \frac{2\,\sqrt{-c^2x^2+1}bdeg}{3\,c^3} + \frac{\sqrt{-c^2x^2+1}bd^2h}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2h}{25\,c^5} \\
&+ \frac{5\,be^2g\arcsin(cx)}{32\,c^4} + \frac{5\,bdeh\arcsin(cx)}{16\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}be^2h}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}be^2h}{5\,c^5}
\end{aligned}$$

```
[In] integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/3
*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*(c
^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcsin(
c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2
```

```
+ 1)*b*d*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e
*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*
f*x*arcsin(c*x)/c^2 + 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*arcsin(
c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 +
1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^2*g*x/c^3 - 1/8*(-c^2*x^2 + 1)
^(3/2)*b*d*e*h*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^2*
g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^2 + 1/4*(c^
2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*e*h*arcsin(c
*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^2*h*x*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^
(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 - 1/9*(-c^2*x^2 +
1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^2*g*x/c^3 + 5/16*sqrt(-c
^2*x^2 + 1)*b*d*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsin(c*x)/c^4 + (c^
2*x^2 - 1)*b*d*e*h*arcsin(c*x)/c^4 + 1/5*b*e^2*h*x*arcsin(c*x)/c^4 + 1/3*sq
rt(-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e*g/c^3 + 1/3*sqr
t(-c^2*x^2 + 1)*b*d^2*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2
*h/c^5 + 5/32*b*e^2*g*arcsin(c*x)/c^4 + 5/16*b*d*e*h*arcsin(c*x)/c^4 - 2/15
*(-c^2*x^2 + 1)^(3/2)*b*e^2*h/c^5 + 1/5*sqrt(-c^2*x^2 + 1)*b*e^2*h/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$=\int \left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d+e\,x\right)^2\,\left(h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2),x)
[Out] int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2), x)
```

3.99 $\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 24, antiderivative size = 223

$$\begin{aligned}
&\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx \\
&=\frac{b(eg+dh)x^2\sqrt{1-c^2x^2}}{9c}+\frac{behx^3\sqrt{1-c^2x^2}}{16c} \\
&\quad+\frac{b(32(9c^2df+2eg+2dh)+9(8c^2(ef+dg)+3eh)\,x)\sqrt{1-c^2x^2}}{288c^3} \\
&\quad-\frac{b(8c^2(ef+dg)+3eh)\arcsin(cx)}{32c^4}+dfx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))
\end{aligned}$$

```
[Out] -1/32*b*(8*c^2*(d*g+e*f)+3*e*h)*arcsin(c*x)/c^4+d*f*x*(a+b*arcsin(c*x))+1/2
*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d*h+e*g)*x^3*(a+b*arcsin(c*x))+1/4*e*
h*x^4*(a+b*arcsin(c*x))+1/9*b*(d*h+e*g)*x^2*(-c^2*x^2+1)^(1/2)/c+1/16*b*e*h
*x^3*(-c^2*x^2+1)^(1/2)/c+1/288*b*(288*c^2*d*f+64*d*h+64*e*g+9*(8*c^2*(d*g+
e*f)+3*e*h)*x)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used

$= \{4833,\ 12,\ 1823,\ 794,\ 222\}$

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx)) + \frac{1}{4}ehx^4(a+b\arcsin(cx))-\frac{b\arcsin(cx)\left(8c^2(dg+ef)+3eh\right)}{32c^4}+\frac{bx^2\sqrt{1-c^2x^2}(dh+eg)}{9c} + \frac{behx^3\sqrt{1-c^2x^2}}{16c}+\frac{b\sqrt{1-c^2x^2}(9x(8c^2(dg+ef)+3eh)+32(9c^2df+2dh+2eg))}{288c^3}$$

```
[In] Int[(d + e*x)*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(e*g + d*h)*x^2*Sqrt[1 - c^2*x^2])/(9*c) + (b*e*h*x^3*Sqrt[1 - c^2*x^2])
/(16*c) + (b*(32*(9*c^2*d*f + 2*e*g + 2*d*h) + 9*(8*c^2*(e*f + d*g) + 3*e*h
)*x)*Sqrt[1 - c^2*x^2])/(288*c^3) - (b*(8*c^2*(e*f + d*g) + 3*e*h)*ArcSin[c
*x])/(32*c^4) + d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[
c*x]))/2 + ((e*g + d*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*h*x^4*(a + b*ArcSin
[c*x]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x(12df+6(ef+dg)x+4(eg+dh)x^2+3ehx^3)}{12\sqrt{1-c^2x^2}}\,dx \\
&= dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}ehx^4(a+b\arcsin(cx))-\frac{1}{12}(bc)\int\frac{x(12df+6(ef+dg)x+4(eg+dh)x^2+3ehx^3)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{behx^3\sqrt{1-c^2x^2}}{16c}+dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx)) \\
&\quad+\frac{b\int\frac{x(-48c^2df-3(8c^2(ef+dg)+3eh)x-16c^2(eg+dh)x^2)}{\sqrt{1-c^2x^2}}\,dx}{48c} \\
&= \frac{b(eg+dh)x^2\sqrt{1-c^2x^2}}{9c}+\frac{behx^3\sqrt{1-c^2x^2}}{16c}+dfx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}ehx^4(a+b\arcsin(cx))-\frac{b\int\frac{x(16c^2(9c^2df+2eg+2dh)+9c^2(8c^2(ef+dg)+3eh)x)}{\sqrt{1-c^2x^2}}\,dx}{144c^3} \\
&= \frac{b(eg+dh)x^2\sqrt{1-c^2x^2}}{9c}+\frac{behx^3\sqrt{1-c^2x^2}}{16c} \\
&\quad+\frac{b(32(9c^2df+2eg+2dh)+9(8c^2(ef+dg)+3eh)x)\sqrt{1-c^2x^2}}{288c^3} \\
&\quad+dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx)) \\
&\quad-\frac{(b(8c^2(ef+dg)+3eh))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3}
\end{aligned}$$

$$= \frac{b(eg+dh)x^2\sqrt{1-c^2x^2}}{9c} + \frac{behx^3\sqrt{1-c^2x^2}}{16c} + \frac{b(32(9c^2df+2eg+2dh)+9(8c^2(ef+dg)+3eh)\,x)\sqrt{1-c^2x^2}}{288c^3} - \frac{b(8c^2(ef+dg)+3eh)\arcsin(cx)}{32c^4} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}ehx^4(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.83

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \frac{24ac^4x(2d(6f+x(3g+2hx))+ex(6f+x(4g+3hx)))+bc\sqrt{1-c^2x^2}(64eg+64dh+27ehx+2c^2(4d(36$$

```
[In] Integrate[(d + e*x)*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (24*a*c^4*x*(2*d*(6*f + x*(3*g + 2*h*x)) + e*x*(6*f + x*(4*g + 3*h*x))) + b
*c*Sqrt[1 - c^2*x^2]*(64*e*g + 64*d*h + 27*e*h*x + 2*c^2*(4*d*(36*f + 9*g*x
 + 4*h*x^2) + e*x*(36*f + 16*g*x + 9*h*x^2))) + 3*b*(-24*c^2*(e*f + d*g) -
9*e*h + 8*c^4*x*(2*d*(6*f + 3*g*x + 2*h*x^2) + e*x*(6*f + 4*g*x + 3*h*x^2))
)*ArcSin[c*x])/(288*c^4)
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.22

method	result
parts	$a\left(\frac{eh\,x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eh\,x^4}{4}+\frac{c\arcsin(cx)x^3dh}{3}+\frac{c\arcsin(cx)eg\,x^3}{3}+\frac{c\arcsin(cx}{2}\right.}{}$
derivativedivides	$\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(dch+ecg)c^3x^3}{3}+\frac{\left(d\,c^2g+e\,c^2f\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\arcsin(\right.}{}$
default	$\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(dch+ecg)c^3x^3}{3}+\frac{\left(d\,c^2g+e\,c^2f\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\arcsin(\right.}{}$

```
[In] int((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/4*e*h*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/4*c*arcsin
(c*x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*e*g*x^3+1/2*c*arc
sin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/12/c^3*(3*
e*h*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(
c*x))-12*d*c^3*f*(-c^2*x^2+1)^(1/2)+(4*c*d*h+4*c*e*g)*(-1/3*c^2*x^2*(-c^2*x
^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(6*c^2*d*g+6*c^2*e*f)*(-1/2*c*x*(-c^2*x
^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.10

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \frac{72\,ac^4ehx^4+288\,ac^4dfx+96\,(ac^4eg+ac^4dh)x^3+144\,(ac^4ef+ac^4dg)x^2+3\,(24\,bc^4ehx^4+96\,bc^4dfx-\cdots}{\cdots}$$

```
[In] integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(72*a*c^4*e*h*x^4 + 288*a*c^4*d*f*x + 96*(a*c^4*e*g + a*c^4*d*h)*x^3
+ 144*(a*c^4*e*f + a*c^4*d*g)*x^2 + 3*(24*b*c^4*e*h*x^4 + 96*b*c^4*d*f*x -
24*b*c^2*e*f - 24*b*c^2*d*g + 32*(b*c^4*e*g + b*c^4*d*h)*x^3 - 9*b*e*h + 48
*(b*c^4*e*f + b*c^4*d*g)*x^2)*arcsin(c*x) + (18*b*c^3*e*h*x^3 + 288*b*c^3*d
*f + 64*b*c*e*g + 64*b*c*d*h + 32*(b*c^3*e*g + b*c^3*d*h)*x^2 + 9*(8*b*c^3*
e*f + 8*b*c^3*d*g + 3*b*c*e*h)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(209) = 418$.

Time = 0.34 (sec) , antiderivative size = 449, normalized size of antiderivative = 2.01

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \begin{cases} adfx+\frac{adgx^2}{2}+\frac{adhx^3}{3}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+\frac{aehx^4}{4}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{bdhx^3\operatorname{asin}(cx)}{3}+\frac{befx^2\operatorname{asin}(cx)}{2}\cdots \\ a\left(dfx+\frac{dgx^2}{2}+\frac{dhx^3}{3}+\frac{efx^2}{2}+\frac{egx^3}{3}+\frac{ehx^4}{4}\right) \end{cases}$$

```
[In] integrate((e*x+d)*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*e*f*x**2/2 + a*e*g*x**
3/3 + a*e*h*x**4/4 + b*d*f*x*asin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*d*h*x**
3*asin(c*x)/3 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*x**
```

```
4*asin(c*x)/4 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2 + 1)
/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*f*x*sqrt(-c**2*x**2 +
1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c**2*x*
*2 + 1)/(16*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2) + 2*b*
d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) +
 3*b*e*h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e*h*asin(c*x)/(32*c**4), Ne
(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x**3/3 + e*f*x**2/2 + e*g*x**3/3 + e*
h*x**4/4), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.50

$$\begin{aligned}\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx &= \frac{1}{4}aehx^4+\frac{1}{3}aegx^3+\frac{1}{3}adhx^3+\frac{1}{2}aefx^2+\frac{1}{2}adgx^2 \\ &+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bef \\ &+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bdg \\ &+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg \\ &+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh \\ &+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)beh \\ &+adfx+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bdf}{c}\end{aligned}$$

```
[In] integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x
^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3
))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*
x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2
*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*h + 1/32*(8*x^4*arcsin(c*x)
+ (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x
)/c^5)*c)*b*e*h + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 448 vs. $2(200) = 400$.

Time = 0.30 (sec) , antiderivative size = 448, normalized size of antiderivative = 2.01

$$\begin{aligned}
&\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx \\
&= \frac{1}{4}aehx^4 + \frac{1}{3}aegx^3 + \frac{1}{3}adhx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3c^2} \\
&+ \frac{(c^2x^2-1)bdhx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4c} \\
&+ \frac{(c^2x^2-1)bef\arcsin(cx)}{2c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2c^2} + \frac{begx\arcsin(cx)}{3c^2} \\
&+ \frac{bdhx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdf}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}behx}{16c^3} + \frac{(c^2x^2-1)aef}{2c^2} \\
&+ \frac{(c^2x^2-1)adg}{2c^2} + \frac{bef\arcsin(cx)}{4c^2} + \frac{bdg\arcsin(cx)}{4c^2} + \frac{(c^2x^2-1)^2beh\arcsin(cx)}{4c^4} \\
&- \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdh}{9c^3} + \frac{5\sqrt{-c^2x^2+1}behx}{32c^3} \\
&+ \frac{(c^2x^2-1)beh\arcsin(cx)}{2c^4} + \frac{\sqrt{-c^2x^2+1}beg}{3c^3} + \frac{\sqrt{-c^2x^2+1}bdh}{3c^3} + \frac{5beh\arcsin(cx)}{32c^4}
\end{aligned}$$

```
[In] integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + b*d*f*x*arcsin(c*x) + a*d*f
*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*x*
arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)
*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*
d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d*h*x*arcsin(c*x)
/c^2 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*h*x/c^3 +
 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e*f*arcs
in(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h*arcsin(
c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*
d*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e*h*arc
sin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*
d*h/c^3 + 5/32*b*e*h*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)\,\left(h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2),x)
[Out] int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2), x)
```

3.100 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 459

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} \\
&\quad + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} \\
&\quad + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} \\
&\quad + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}$$

```
[Out] -1/4*b*h*arcsin(c*x)/c^2/e-1/2*I*b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)^2/e^3+(-
d*h+e*g)*x*(a+b*arcsin(c*x))/e^2+1/2*h*x^2*(a+b*arcsin(c*x))/e-b*(d^2*h-d*e
*g+e^2*f)*arcsin(c*x)*ln(e*x+d)/e^3+(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))*l
n(e*x+d)/e^3+b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)
^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)*ln
```

```
(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*b*(d^2*h
-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(
1/2)))/e^3-I*b*(d^2*h-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))
/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+1/4*b*(e*h*x-4*d*h+4*e*g)*(-c^2*x^2+1)^(1/2
)/c/e^2
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 459, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462, Rules used = {712, 4837, 12, 6874, 794, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2} \\
&\quad+\frac{hx^2(a+b\arcsin(cx))}{2e}-\frac{ib(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad-\frac{ib(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad+\frac{b\arcsin(cx)(d^2h-deg+e^2f)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad+\frac{b\arcsin(cx)(d^2h-deg+e^2f)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^3} \\
&\quad-\frac{bh\arcsin(cx)}{4c^2e}-\frac{ib\arcsin(cx)^2(d^2h-deg+e^2f)}{2e^3} \\
&\quad-\frac{b\arcsin(cx)\log(d+ex)(d^2h-deg+e^2f)}{e^3}+\frac{b\sqrt{1-c^2x^2}(4(eg-dh)+ehx)}{4ce^2}
\end{aligned}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] (b*(4*(e*g - d*h) + e*h*x)*Sqrt[1 - c^2*x^2])/(4*c*e^2) - (b*h*ArcSin[c*x])
/(4*c^2*e) - ((I/2)*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]^2)/e^3 + ((e*g -
d*h)*x*(a + b*ArcSin[c*x]))/e^2 + (h*x^2*(a + b*ArcSin[c*x]))/(2*e) + (b*(e
^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sq
rt[c^2*d^2 - e^2])])/e^3 + (b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 - (
I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3 - (b*(e^2*f - d*e*
g + d^2*h)*ArcSin[c*x]*Log[d + e*x])/e^3 + ((e^2*f - d*e*g + d^2*h)*(a + b*
ArcSin[c*x])*Log[d + e*x])/e^3 - (I*b*(e^2*f - d*e*g + d^2*h)*PolyLog[2, (I
*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3 - (I*b*(e^2*f - d*e
*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]
)/e^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e} \\ &\quad+\frac{\left(e^2f-deg+d^2h\right)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\ &\quad-(bc)\int\frac{ex(2eg-2dh+ehx)+2(e^2f-deg+d^2h)\log(d+ex)}{2e^3\sqrt{1-c^2x^2}}\,dx \\ &= \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e} \\ &\quad+\frac{\left(e^2f-deg+d^2h\right)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\ &\quad-\frac{(bc)\int\frac{ex(2eg-2dh+ehx)+2\left(e^2f-deg+d^2h\right)\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{2e^3}\end{aligned}$$

$$= \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bc)\int\left(\frac{ex(2eg-2dh+ehx)}{\sqrt{1-c^2x^2}} + \frac{2(e^2f-deg+d^2h)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^3}$$

$$= \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bc)\int\frac{x(2eg-2dh+ehx)}{\sqrt{1-c^2x^2}}dx}{2e^2} - \frac{(bc(e^2f-deg+d^2h))\int\frac{\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^3}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bh)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{4ce} + \frac{(bc(e^2f-deg+d^2h))\int\frac{\arcsin(cx)}{cd+cex}dx}{e^2}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bc(e^2f-deg+d^2h))\,\text{Subst}\left(\int\frac{x\cos(x)}{c^2d+ce\sin(x)}dx,x,\arcsin(cx)\right)}{e^2}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bc(e^2f-deg+d^2h))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}dx,x,\arcsin(cx)\right)}{e^2} + \frac{(bc(e^2f-deg+d^2h))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}dx,x,\arcsin(cx)\right)}{e^2}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(b(e^2f-deg+d^2h))\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^3} - \frac{(b(e^2f-deg+d^2h))\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^3}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(ib(e^2f-deg+d^2h))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^3} + \frac{(ib(e^2f-deg+d^2h))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^3}$$

$$= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

Mathematica [A] (verified)

Time = 0.93 (sec) , antiderivative size = 457, normalized size of antiderivative = 1.00

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$$

$$= \frac{\frac{2be(eg-dh)\sqrt{1-c^2x^2}}{c} + \frac{be^2hx\sqrt{1-c^2x^2}}{2c} - \frac{be^2h\arcsin(cx)}{2c^2} - ib(e^2f-deg+d^2h)\arcsin(cx)^2 + 2e(eg-dh)x(a+b\operatorname{arc}}{}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] ((2*b*e*(e*g - d*h)*Sqrt[1 - c^2*x^2])/c + (b*e^2*h*x*Sqrt[1 - c^2*x^2])/(2
*c) - (b*e^2*h*ArcSin[c*x])/(2*c^2) - I*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*
x]^2 + 2*e*(e*g - d*h)*x*(a + b*ArcSin[c*x]) + e^2*h*x^2*(a + b*ArcSin[c*x]
) + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]))
/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*
Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e^2*f -
 d*e*g + d^2*h)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*f - d*e*g + d^2*h)*(a + b
*ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*f - d*e*g + d^2*h)*PolyLog[2, (I*
e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*(e^2*f - d*e*g
+ d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(
2*e^3)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2437 vs. 2(464) = 928.

Time = 2.26 (sec) , antiderivative size = 2438, normalized size of antiderivative = 5.31

method	result	size
parts	Expression too large to display	2438
derivativedivides	Expression too large to display	2489
default	Expression too large to display	2489

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

```
[Out] -I*b*c^2/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-I*b*c^2/e*f/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c
^2*d^2+e^2)^(1/2)))*d^2-I*b*c^2/e^3*h*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-
I*b*c^2/e^3*h*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(
-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+I*b*c^2/e^2*d^3*g/(c^2*d
^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*
d*c-(-c^2*d^2+e^2)^(1/2)))+a*(1/e^2*(1/2*h*x^2*e-x*d*h+x*e*g)+(d^2*h-d*e*g+
e^2*f)/e^3*ln(e*x+d))+b*g*(-c^2*x^2+1)^(1/2)/c/e+I*b*c^2/e^2*d^3*g/(c^2*d^2
-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c
*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))
)*d^2+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-b*c^2/e^2*d^3
*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d
^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c^2/e^2*d^3*g*arcsin(c*x)/(c
^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I
*d*c-(-c^2*d^2+e^2)^(1/2)))+b*c^2/e^3*h*d^4*arcsin(c*x)/(c^2*d^2-e^2)*ln((I
*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^
2)^(1/2)))+b*c^2/e^3*h*d^4*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2
*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b/e*h*
d^2*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-b/e*h*d^2*arcsin(c*x)/(c^2*d^
2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+
(-c^2*d^2+e^2)^(1/2)))+I*b/e*h*d^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*
x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b/e*h
*d^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)
^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/8*b/c^2*h/e*sin(2*arcsin(c*x))+b/e*
arcsin(c*x)*x*g-1/2*I*b*arcsin(c*x)^2/e*f+I*b*e*f/(c^2*d^2-e^2)*dilog((I*d*
c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^
(1/2)))+I*b*e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c
```

```
^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*d*g*arcsin(c*x)/(c^2*d^2
-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(
-c^2*d^2+e^2)^(1/2)))-b*e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*e*f
*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2
+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*
ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d
^2+e^2)^(1/2)))-b/c/e^2*(-c^2*x^2+1)^(1/2)*d*h-b/e^2*arcsin(c*x)*x*d*h-1/4*
b/c^2*arcsin(c*x)*h/e*cos(2*arcsin(c*x))-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c
+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(
1/2)))+1/2*I*b*arcsin(c*x)^2/e^2*d*g-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)
))-1/2*I*b*arcsin(c*x)^2/e^3*d^2*h
```

Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
[Out] integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e*x
 + d), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2)}{d+ex}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
[Out] a*g*(x/e - d*log(e*x + d)/e^2) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2 -
 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*h*x^2 + b*g*x + b*f)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
[Out] integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{d+e\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x),x)
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x), x)
```

3.101 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 460

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \frac{bh\sqrt{1-c^2x^2}}{ce^2} - \frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3} + \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} + \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

```
[Out] -1/2*I*b*(-2*d*h+e*g)*arcsin(c*x)^2/e^3+h*x*(a+b*arcsin(c*x))/e^2-(d^2*h-d*
e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)-b*(-2*d*h+e*g)*arcsin(c*x)*ln(e*x+
```

```
d)/e^3+(-2*d*h+e*g)*(a+b*arcsin(c*x))*ln(e*x+d)/e^3+b*(-2*d*h+e*g)*arcsin(c
*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*(-
2*d*h+e*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^
2)^(1/2)))/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d-(c^2*d^2-e^2)^(1/2)))/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(-c^2*x^
2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+b*c*(d^2*h-d*e*g+e^2*f)*arctan((
c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(1/2)+
b*h*(-c^2*x^2+1)^(1/2)/c/e^2
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 460, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$, Rules used = {712, 4837, 12, 6874, 267, 739, 210, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = &-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)} \\ &+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3} \\ &+\frac{hx(a+b\arcsin(cx))}{e^2} \\ &-\frac{ib(eg-2dh)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\ &-\frac{ib(eg-2dh)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\ &+\frac{b\arcsin(cx)(eg-2dh)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\ &+\frac{b\arcsin(cx)(eg-2dh)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^3} \\ &-\frac{ib\arcsin(cx)^2(eg-2dh)}{2e^3} \\ &-\frac{b\arcsin(cx)(eg-2dh)\log(d+ex)}{e^3} \\ &+\frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(d^2h-deg+e^2f)}{e^3\sqrt{c^2d^2-e^2}} \\ &+\frac{bh\sqrt{1-c^2x^2}}{ce^2}\end{aligned}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] (b*h*Sqrt[1 - c^2*x^2])/(c*e^2) - ((I/2)*b*(e*g - 2*d*h)*ArcSin[c*x]^2)/e^3
 + (h*x*(a + b*ArcSin[c*x]))/e^2 - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c
```

```
*x]))/(e^3*(d + e*x)) + (b*c*(e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(
Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) + (b*(e*
g - 2*d*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
- e^2])])/e^3 + (b*(e*g - 2*d*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3 - (b*(e*g - 2*d*h)*ArcSin[c*x]*Log[d +
e*x])/e^3 + ((e*g - 2*d*h)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3 - (I*b*(e*
g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])
/e^3 - (I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^
2*d^2 - e^2])])/e^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - (bc)\int \frac{ehx-\frac{e^2f-deg+d^2h}{d+ex}+(eg-2dh)\log(d+ex)}{e^3\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bc)\int \frac{ehx-\frac{e^2f-deg+d^2h}{d+ex}+(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^3}$$

$$= \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bc)\int \left(\frac{ehx}{\sqrt{1-c^2x^2}}+\frac{-e^2f+deg-d^2h}{(d+ex)\sqrt{1-c^2x^2}}+\frac{(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^3}$$

$$= \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bch)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e^2} - \frac{(bc(eg-2dh))\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{(bc(e^2f-deg+d^2h))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^3}$$

$$= \frac{bh\sqrt{1-c^2x^2}}{ce^2} + \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} - \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bc(eg-2dh))\int \frac{\arcsin(cx)}{cd+cex}\,dx}{e^2} - \frac{(bc(e^2f-deg+d^2h))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^3}$$

$$= \frac{bh\sqrt{1-c^2x^2}}{ce^2} + \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} - \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bc(eg-2dh))\text{Subst}\left(\int \frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2}$$

$$= \frac{bh\sqrt{1-c^2x^2}}{ce^2} - \frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3} + \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} - \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bc(eg-2dh))\text{Subst}\left(\int \frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(bc(eg-2dh))\text{Subst}\left(\int \frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^2}$$

$$= \frac{bh\sqrt{1-c^2x^2}}{ce^2} - \frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3} + \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} + \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(b(eg-2dh))\text{Subst}\left(\int \log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^3} - \frac{(b(eg-2dh))\text{Subst}\left(\int \log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^3}$$

$$=\frac{bh\sqrt{1-c^2x^2}}{ce^2}-\frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3}+\frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3}+\frac{(ib(eg-2dh))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^3}+\frac{(ib(eg-2dh))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^3}$$

$$=\frac{bh\sqrt{1-c^2x^2}}{ce^2}-\frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3}+\frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3}-\frac{ib(eg-2dh)\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{ib(eg-2dh)\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

Mathematica [A] (verified)

Time = 0.99 (sec) , antiderivative size = 432, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{\frac{beh\sqrt{1-c^2x^2}}{c}-\frac{1}{2}ib(eg-2dh)\arcsin(cx)^2+ehx(a+b\arcsin(cx))-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{d+ex}+\frac{bc(e^2f-deg+d^2h)}{}}{}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] ((b*e*h*Sqrt[1 - c^2*x^2])/c - (I/2)*b*(e*g - 2*d*h)*ArcSin[c*x]^2 + e*h*x*
(a + b*ArcSin[c*x]) - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(d + e*
x) + (b*c*(e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + b*(e*g - 2*d*h)*ArcSin[c*x]*Log
[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*(e*g - 2*d
*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])
] - b*(e*g - 2*d*h)*ArcSin[c*x]*Log[d + e*x] + (e*g - 2*d*h)*(a + b*ArcSin[
c*x])*Log[d + e*x] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(
c*d - Sqrt[c^2*d^2 - e^2])] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1858 vs. 2(467) = 934.

Time = 4.20 (sec) , antiderivative size = 1859, normalized size of antiderivative = 4.04

method	result	size
parts	Expression too large to display	1859
derivativedivides	Expression too large to display	1900
default	Expression too large to display	1900

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/e^2*h*x-1/e^3*(d^2*h-d*e*g+e^2*f)/(e*x+d)+(-2*d*h+e*g)/e^3*ln(e*x+d))+
b/c*(2/e*c*h*d*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*c*g/(c^2*d^2-e^2
)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-
c^2*d^2+e^2)^(1/2)))+1/e^2*c^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*
x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2))
)*d^2+2*I/e^3*c^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/2*I*c*arcsin(c*x
```

```
)^2*g/e^2-I/e^2*c^3*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+1/2*(-I*(-c^2*
x^2+1)^(1/2)+c*x)*h*(arcsin(c*x)+I)/e^2+I*c*arcsin(c*x)^2/e^3*d*h+1/2*(c*x+
I*(-c^2*x^2+1)^(1/2))*h*(arcsin(c*x)-I)/e^2-c*g*arcsin(c*x)/(c^2*d^2-e^2)*l
n((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^
2+e^2)^(1/2)))+2/e*c^2*f/(c^2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2
+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-2*I/e*c*h*d/(c^2*d^2-e^2)*dilog(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+
e^2)^(1/2)))-2/e^3*c^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-
c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-2/
e^3*c^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2/e*c*h*d*arcsin(c*
x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/
2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-c*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c
-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^
(1/2)))+2/e^3*c^2*d^2*h/(c^2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2+
1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-2/e^2*c^2*d*g/(c^2*d^2-e^2)^(1/2)
*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+I
*c*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2
)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/e^2*c^3*g*arcsin(c*x)/(c^2*d^2-e^
2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^
2*d^2+e^2)^(1/2)))*d^2-2*I/e*c*h*d/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2
*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I/e
^3*c^3*h*d^3/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2
*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-(d^2*h-d*e*g+e^2*f)*arcsin(
c*x)*c^2/e^3/(c*e*x+c*d)-I/e^2*c^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2)
```

Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^2
*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^2}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2, x)
```

3.102 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 488

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx \\
&= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)(d+ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} \\
&\quad - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} \\
&\quad - \frac{bc(2e^2(eg-2dh)-c^2d(e^2f+deg-3d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} \\
&\quad + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} + \frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}$$

```
[Out] -1/2*I*b*h*arcsin(c*x)^2/e^3-1/2*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/
(e*x+d)^2-(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)-1/2*b*c*(2*e^2*(-2*d*h
+e*g)-c^2*d*(-3*d^2*h+d*e*g+e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/
(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)-b*h*arcsin(c*x)*ln(e*x+d)/e^3+h
*(a+b*arcsin(c*x))*ln(e*x+d)/e^3+b*h*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+
1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*h*arcsin(c*x)*ln(1-I*e*(I*c*x+(-
c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*b*h*polylog(2,I*e*(I*c*x
+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-I*b*h*polylog(2,I*e*(I*
c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+1/2*b*c*(d^2*h-d*e*g
+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 488, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {712, 4837, 12, 6874, 821, 739, 210, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$
$$= -\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3} - \frac{ibh\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ibh\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^3} - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} - \frac{ibh\arcsin(cx)^2}{2e^3} - \frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(2e^2(eg-2dh)-c^2d(-3d^2h+deg+e^2f))}{2e^3(c^2d^2-e^2)^{3/2}} + \frac{bc\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{2e^2(c^2d^2-e^2)(d+ex)}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] (b*c*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/(2*e^2*(c^2*d^2 - e^2)*(d +
 e*x)) - ((I/2)*b*h*ArcSin[c*x]^2)/e^3 - ((e^2*f - d*e*g + d^2*h)*(a + b*Ar
cSin[c*x]))/(2*e^3*(d + e*x)^2) - ((e*g - 2*d*h)*(a + b*ArcSin[c*x]))/(e^3*
(d + e*x)) - (b*c*(2*e^2*(e*g - 2*d*h) - c^2*d*(e^2*f + d*e*g - 3*d^2*h))*A
rcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^3*(c^2*d
^2 - e^2)^(3/2)) + (b*h*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d -
Sqrt[c^2*d^2 - e^2])])/e^3 + (b*h*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3 - (b*h*ArcSin[c*x]*Log[d + e*x])/e^3 +
 (h*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3 - (I*b*h*PolyLog[2, (I*e*E^(I*Arc
Sin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3 - (I*b*h*PolyLog[2, (I*e*E^(I*
ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
```

```
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\text{integral} = &-\frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{2e^3(d+ex)^2} \\
&-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&-(bc)\int\frac{3d^2h-e^2(f+2gx)-de(g-4hx)+2h(d+ex)^2\log(d+ex)}{2e^3(d+ex)^2\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$= -\frac{(e^2f - deg + d^2h)\,(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} - \frac{(bc)\int \frac{3d^2h - e^2(f + 2gx) - de(g - 4hx) + 2h(d + ex)^2\log(d + ex)}{(d + ex)^2\sqrt{1 - c^2x^2}}\,dx}{2e^3}$$

$$= -\frac{(e^2f - deg + d^2h)\,(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} - \frac{(bc)\int \left(\frac{-e^2f - deg + 3d^2h - 2e(eg - 2dh)x}{(d + ex)^2\sqrt{1 - c^2x^2}} + \frac{2h\log(d + ex)}{\sqrt{1 - c^2x^2}}\right)dx}{2e^3}$$

$$= -\frac{(e^2f - deg + d^2h)\,(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} - \frac{(bc)\int \frac{-e^2f - deg + 3d^2h - 2e(eg - 2dh)x}{(d + ex)^2\sqrt{1 - c^2x^2}}\,dx}{2e^3} - \frac{(bch)\int \frac{\log(d + ex)}{\sqrt{1 - c^2x^2}}\,dx}{e^3}$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1 - c^2x^2}}{2e^2\,(c^2d^2 - e^2)\,(d + ex)} - \frac{(e^2f - deg + d^2h)\,(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} - \frac{bh\arcsin(cx)\log(d + ex)}{e^3} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} + \frac{(bch)\int \frac{\arcsin(cx)}{cd + cex}\,dx}{e^2} - \frac{(bc(2e^2(eg - 2dh) - c^2d(e^2f + deg - 3d^2h)))\int \frac{1}{(d + ex)\sqrt{1 - c^2x^2}}\,dx}{2e^3\,(c^2d^2 - e^2)}$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1 - c^2x^2}}{2e^2\,(c^2d^2 - e^2)\,(d + ex)} - \frac{(e^2f - deg + d^2h)\,(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} - \frac{bh\arcsin(cx)\log(d + ex)}{e^3} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} + \frac{(bch)\text{Subst}\left(\int \frac{x\cos(x)}{c^2d + ce\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(bc(2e^2(eg - 2dh) - c^2d(e^2f + deg - 3d^2h)))\,\text{Subst}\left(\int \frac{1}{-c^2d^2 + e^2 - x^2}\,dx, x, \frac{e + c^2dx}{\sqrt{1 - c^2x^2}}\right)}{2e^3\,(c^2d^2 - e^2)}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)(d+ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} - \frac{bc(2e^2(eg-2dh)-c^2d(e^2f+deg-3d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} + \frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} + \frac{(bch)\text{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2} + \frac{(bch)\text{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)(d+ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} - \frac{bc(2e^2(eg-2dh)-c^2d(e^2f+deg-3d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} + \frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} - \frac{(bh)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3} - \frac{(bh)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1 - c^2x^2}}{2e^2(c^2d^2 - e^2)(d + ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} - \frac{(e^2f - deg + d^2h)(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} - \frac{bc(2e^2(eg - 2dh) - c^2d(e^2f + deg - 3d^2h))\arctan\left(\frac{e + c^2dx}{\sqrt{c^2d^2 - e^2}\sqrt{1 - c^2x^2}}\right)}{2e^3(c^2d^2 - e^2)^{3/2}} + \frac{bh\arcsin(cx)\log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd - \sqrt{c^2d^2 - e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd + \sqrt{c^2d^2 - e^2}}\right)}{e^3} - \frac{bh\arcsin(cx)\log(d + ex)}{e^3} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} + \frac{(ibh)\text{Subst}\left(\int \frac{\log\left(1 - \frac{icex}{c^2d - c\sqrt{c^2d^2 - e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^3} + \frac{(ibh)\text{Subst}\left(\int \frac{\log\left(1 - \frac{icex}{c^2d + c\sqrt{c^2d^2 - e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^3}$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1 - c^2x^2}}{2e^2(c^2d^2 - e^2)(d + ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} - \frac{(e^2f - deg + d^2h)(a + b\arcsin(cx))}{2e^3(d + ex)^2} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{e^3(d + ex)} - \frac{bc(2e^2(eg - 2dh) - c^2d(e^2f + deg - 3d^2h))\arctan\left(\frac{e + c^2dx}{\sqrt{c^2d^2 - e^2}\sqrt{1 - c^2x^2}}\right)}{2e^3(c^2d^2 - e^2)^{3/2}} + \frac{bh\arcsin(cx)\log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd - \sqrt{c^2d^2 - e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd + \sqrt{c^2d^2 - e^2}}\right)}{e^3} - \frac{bh\arcsin(cx)\log(d + ex)}{e^3} + \frac{h(a + b\arcsin(cx))\log(d + ex)}{e^3} - \frac{ibh\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd - \sqrt{c^2d^2 - e^2}}\right)}{e^3} - \frac{ibh\,\text{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd + \sqrt{c^2d^2 - e^2}}\right)}{e^3}$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 7.06 (sec) , antiderivative size = 996, normalized size of antiderivative = 2.04

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\frac{-ae^2f+adeg-ad^2h}{2e^3(d+ex)^2}+\frac{-aeg+2adh}{e^3(d+ex)}$$
$$+bf\left(-\frac{c\sqrt{1+\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}}\sqrt{1+\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex}}\operatorname{AppellF1}\left(2,\frac{1}{2},\frac{1}{2},3,-\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex},-\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{4e^2(d+ex)\sqrt{1-c^2x^2}}\right.$$
$$\left.-\frac{\arcsin(cx)}{2e(d+ex)^2}\right)+\frac{ah\log(d+ex)}{e^3}+bg\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^2}\right.$$
$$\left.-\frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e}\right)$$
$$+bh\left(-\frac{2d\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^3}\right.$$
$$+\frac{d^2\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e^2}$$
$$+\frac{-\frac{i\arcsin(cx)^2}{2e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{i\operatorname{PolyLog}\left(2,-\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{i\operatorname{PolyLo}}{}}{e^2}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] (-(a*e^2*f) + a*d*e*g - a*d^2*h)/(2*e^3*(d + e*x)^2) + (-(a*e*g) + 2*a*d*h)
/(e^3*(d + e*x)) + b*f*(-1/4*(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*S
qrt[1 + (-d + Sqrt[c^(-2)]*e)/(d + e*x)]*AppellF1[2, 1/2, 1/2, 3, -((-d + S
qrt[c^(-2)]*e)/(d + e*x)), -((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d + e
*x)*Sqrt[1 - c^2*x^2]) - ArcSin[c*x]/(2*e*(d + e*x)^2)) + (a*h*Log[d + e*x]
)/e^3 + b*g*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*
d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sqrt[1 -
c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^
3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2
- e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt
[c^2*d^2 - e^2])))/(2*e)) + b*h*((-2*d*(-(ArcSin[c*x]/(d + e*x)) + (c*ArcTa
n[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^
2]))/e^3 + (d^2*((c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin
[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*
e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))])
)/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2])))/(2*e^2) + (((-1/2*I)*ArcSin
[c*x]^2)/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d
^2 - e^2])])/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c
^2*d^2 - e^2])])/e - (I*PolyLog[2, ((-I)*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqr
t[c^2*d^2 - e^2])])/e - (I*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c
^2*d^2 - e^2])])/e)/e^2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2026 vs. 2(489) = 978.

Time = 7.00 (sec) , antiderivative size = 2027, normalized size of antiderivative = 4.15

method	result	size
parts	Expression too large to display	2027
derivativedivides	Expression too large to display	2038
default	Expression too large to display	2038

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-(-2*d*h+e*g)/e^3/(e*x+d)-1/2*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^2+h/e^3*ln
(e*x+d))+b/c*(-I/e^3/(c^2*d^2-e^2)*c^3*h*d^2*arcsin(c*x)^2+1/2*c^2*(4*arcsi
n(c*x)*c^3*d^3*e*h*x-2*arcsin(c*x)*c^3*d^2*e^2*g*x+I*c^3*d*e^3*g*x^2+(-c^2*
x^2+1)^(1/2)*c^2*d^2*e^2*h*x-(-c^2*x^2+1)^(1/2)*c^2*d*e^3*g*x-2*I*c^3*d^3*e
*h*x+2*I*c^3*d^2*e^2*g*x-2*I*c^3*d*e^3*f*x-I*c^3*d^2*e^2*h*x^2-4*arcsin(c*x
)*d*e^3*h*c*x-e^2*c^3*d^2*f*arcsin(c*x)-e*c^3*d^3*g*arcsin(c*x)+e^3*c*g*arc
sin(c*x)*d-3*e^2*c*d^2*h*arcsin(c*x)-I*c^3*d^2*e^2*f+I*c^3*d^3*e*g+(-c^2*x^
2+1)^(1/2)*c^2*d^3*e*h-(-c^2*x^2+1)^(1/2)*c^2*d^2*e^2*g+(-c^2*x^2+1)^(1/2)*
```

c^2*d*e^3*f+2*arcsin(c*x)*e^4*g*c*x+e^4*c*f*arcsin(c*x)+3*c^3*d^4*h*arcsin(
c*x)-I*c^3*d^4*h-I*c^3*e^4*f*x^2+(-c^2*x^2+1)^(1/2)*c^2*e^4*f*x)/(c*e*x+c*d
)^2/(c^2*d^2-e^2)/e^3+I/e/(c^2*d^2-e^2)*c*h*arcsin(c*x)^2+2*I/e/(c^2*d^2-e^
2)^2*c^3*h*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/
(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-2/(c^2*d^2-e^2)^(3/2)*c^2*g*arctan(1/2*(2
*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-3/e^3/(c^2*d^2-
e^2)^(3/2)*c^4*d^3*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c
^2*d^2-e^2)^(1/2))+e/(c^2*d^2-e^2)^2*c*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2
*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+e/(c^2
*d^2-e^2)^2*c*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^
2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c
^2*d^2+e^2)^(1/2)))+2*I/e/(c^2*d^2-e^2)^2*c^3*h*dilog((I*d*c+(I*c*x+(-c^2*x
^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+1/2*
I*c*arcsin(c*x)^2*h/e^3-I*e/(c^2*d^2-e^2)^2*c*h*dilog((I*d*c+(I*c*x+(-c^2*x
^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+4/e/(c^2
*d^2-e^2)^(3/2)*c^2*d*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)
/(c^2*d^2-e^2)^(1/2))+1/e^2/(c^2*d^2-e^2)^(3/2)*c^4*d^2*g*arctan(1/2*(2*(I*
c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+1/e/(c^2*d^2-e^2)^(
3/2)*c^4*d*f*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e
^2)^(1/2))-2/e/(c^2*d^2-e^2)^2*c^3*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2-2/e/(c
^2*d^2-e^2)^2*c^3*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+1/e^3/(c^2*d^2-e^2)^2*c
^5*h*d^4*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^
(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4*arcsin
(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(
-c^2*d^2+e^2)^(1/2)))-I*e/(c^2*d^2-e^2)^2*c*h*dilog((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e^3/(c^2
*d^2-e^2)^2*c^5*h*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e
^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))))

Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")

[Out] integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^3
*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^3}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
[Out] integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3,x)
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3, x)
```

3.103 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4} dx$

Optimal result

Integrand size = 26, antiderivative size = 349

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4} dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^3(c^2d^2-e^2)^{5/2}}$$

```
[Out] -1/3*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^3-1/2*(-2*d*h+e*g)*(
a+b*arcsin(c*x))/e^3/(e*x+d)^2-h*(a+b*arcsin(c*x))/e^3/(e*x+d)+1/6*b*c*(6*e
^4*h+c^2*e^2*(-5*d^2*h-4*d*e*g+e^2*f)+c^4*d^2*(2*d^2*h+d*e*g+2*e^2*f))*arct
an((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(5
/2)+1/6*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d
)^2-1/2*b*c*(e^2*(-2*d*h+e*g)-c^2*(-d^3*h+d*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/
(c^2*d^2-e^2)^2/(e*x+d)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {712, 4837, 12, 1665, 821, 739, 210}

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = -\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(c^4d^2(2d^2h+deg+2e^2f)+c^2e^2(-5d^2h-4deg+e^2f)+6e^4h)}{6e^3(c^2d^2-e^2)^{5/2}} + \frac{bc\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc\sqrt{1-c^2x^2}(e^2(eg-2dh)-c^2(de^2f-d^3h))}{2e^2(c^2d^2-e^2)^2(d+ex)}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

```
[Out] (b*c*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/(6*e^2*(c^2*d^2 - e^2)*(d +
 e*x)^2) - (b*c*(e^2*(e*g - 2*d*h) - c^2*(d*e^2*f - d^3*h))*Sqrt[1 - c^2*x^
2])/(2*e^2*(c^2*d^2 - e^2)^2*(d + e*x)) - ((e^2*f - d*e*g + d^2*h)*(a + b*A
rcSin[c*x]))/(3*e^3*(d + e*x)^3) - ((e*g - 2*d*h)*(a + b*ArcSin[c*x]))/(2*e
^3*(d + e*x)^2) - (h*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)) + (b*c*(6*e^4*h +
 c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f + d*e*g + 2*d^2*h))
*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(6*e^3*(c^2
*d^2 - e^2)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}\\
&\quad-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}-(bc)\int\frac{-2e^2f-deg-2d^2h-3e(eg+2dh)x-6e^2hx^2}{6e^3(d+ex)^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}\\
&\quad-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}-\frac{(bc)\int\frac{-2e^2f-deg-2d^2h-3e(eg+2dh)x-6e^2hx^2}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^3}
\end{aligned}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} - \frac{(bc)\int \frac{2(3e^3g-c^2d(2e^2f+deg+2d^2h))+2e(6e^2h+c^2(e^2f-deg-5d^2h))x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e^3(c^2d^2-e^2)}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{(bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{6e^3(c^2d^2-e^2)^2}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} - \frac{(bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h)))\,\mathrm{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e-}{\sqrt{1}}\right.}{6e^3(c^2d^2-e^2)^2}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^3(c^2d^2-e^2)^{5/2}}$$

Mathematica [A] (verified)

Time = 2.07 (sec) , antiderivative size = 442, normalized size of antiderivative = 1.27

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx =$$

$$-\frac{\frac{2a(e^2f-deg+d^2h)}{(d+ex)^3}+\frac{3a(eg-2dh)}{(d+ex)^2}+\frac{6ah}{d+ex}+\frac{bce\sqrt{1-c^2x^2}(e^2(-5d^2h+e^2(f+3gx)+2de(g-3hx))+c^2d(-4de^2f+2d^3h-3e^3fx+d^2e(g+3h}{(-c^2d^2+e^2)^2(d+ex)^2}}{}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

```
[Out] -1/6*((2*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^3 + (3*a*(e*g - 2*d*h))/(d +
e*x)^2 + (6*a*h)/(d + e*x) + (b*c*e*Sqrt[1 - c^2*x^2]*(e^2*(-5*d^2*h + e^2*
(f + 3*g*x) + 2*d*e*(g - 3*h*x)) + c^2*d*(-4*d*e^2*f + 2*d^3*h - 3*e^3*f*x
+ d^2*e*(g + 3*h*x))))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) + (b*(2*d^2*h + d
*e*(g + 6*h*x) + e^2*(2*f + 3*x*(g + 2*h*x)))*ArcSin[c*x])/(d + e*x)^3 - (b
*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f + d*e*
g + 2*d^2*h))*Log[d + e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e
^2]) + (b*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2
*f + d*e*g + 2*d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^
2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1176 vs. 2(329) = 658.

Time = 4.63 (sec) , antiderivative size = 1177, normalized size of antiderivative = 3.37

method	result	size
parts	Expression too large to display	1177
derivativedivides	Expression too large to display	1188
default	Expression too large to display	1188

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/e^3*h/(e*x+d)-1/2*(-2*d*h+e*g)/e^3/(e*x+d)^2-1/3*(d^2*h-d*e*g+e^2*f)/
e^3/(e*x+d)^3)+b/c*(-c^2*arcsin(c*x)/e^3*h/(c*e*x+c*d)-1/3*c^4*arcsin(c*x)/
e^3/(c*e*x+c*d)^3*d^2*h+1/3*c^4*arcsin(c*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^4*a
rcsin(c*x)/e/(c*e*x+c*d)^3*f+c^3*arcsin(c*x)/e^3/(c*e*x+c*d)^2*d*h-1/2*c^3*
arcsin(c*x)*g/e^2/(c*e*x+c*d)^2+1/6*c^2/e^3*(-6*h/e/(-(c^2*d^2-e^2)/e^2)^(1
/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/
2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e
))-3*c*(2*d*h-e*g)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d
*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^
2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2
```

```
)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/
(c*x+d*c/e)))+2*c^2*(d^2*h-d*e*g+e^2*f)/e^3*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c
/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*
e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c
*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)
^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^
(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*
c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2
)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1488 vs. $2(329) = 658$.

Time = 72.26 (sec) , antiderivative size = 3003, normalized size of antiderivative = 8.60

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] [-1/12*(12*(a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8)*h*x^
2 + sqrt(-c^2*d^2 + e^2)*(((2*b*c^5*d^2*e^5 + b*c^3*e^7)*f + (b*c^5*d^3*e^4
 - 4*b*c^3*d*e^6)*g + (2*b*c^5*d^4*e^3 - 5*b*c^3*d^2*e^5 + 6*b*c*e^7)*h)*x^
3 + 3*((2*b*c^5*d^3*e^4 + b*c^3*d*e^6)*f + (b*c^5*d^4*e^3 - 4*b*c^3*d^2*e^5
)*g + (2*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + 6*b*c*d*e^6)*h)*x^2 + (2*b*c^5*d
^5*e^2 + b*c^3*d^3*e^4)*f + (b*c^5*d^6*e - 4*b*c^3*d^4*e^3)*g + (2*b*c^5*d^
7 - 5*b*c^3*d^5*e^2 + 6*b*c*d^3*e^4)*h + 3*((2*b*c^5*d^4*e^3 + b*c^3*d^2*e^
5)*f + (b*c^5*d^5*e^2 - 4*b*c^3*d^3*e^4)*g + (2*b*c^5*d^6*e - 5*b*c^3*d^4*e
^3 + 6*b*c*d^2*e^5)*h)*x)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2
)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e
^2*x^2 + 2*d*e*x + d^2)) + 4*(a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2
*e^6 - a*e^8)*f + 2*(a*c^6*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d^3*e^5 - a*d*
e^7)*g + 4*(a*c^6*d^8 - 3*a*c^4*d^6*e^2 + 3*a*c^2*d^4*e^4 - a*d^2*e^6)*h +
6*((a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8)*g + 2*(a*c^6
*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d^3*e^5 - a*d*e^7)*h)*x + 2*(6*(b*c^6*d^
6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*h*x^2 + 2*(b*c^6*d^6*e^2
 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*f + (b*c^6*d^7*e - 3*b*c^4*d^
5*e^3 + 3*b*c^2*d^3*e^5 - b*d*e^7)*g + 2*(b*c^6*d^8 - 3*b*c^4*d^6*e^2 + 3*b
*c^2*d^4*e^4 - b*d^2*e^6)*h + 3*((b*c^6*d^6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2
*d^2*e^6 - b*e^8)*g + 2*(b*c^6*d^7*e - 3*b*c^4*d^5*e^3 + 3*b*c^2*d^3*e^5 -
b*d*e^7)*h)*x)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*(3*((b*c^5*d^3*e^5 - b*c^
3*d*e^7)*f - (b*c^3*d^2*e^6 - b*c*e^8)*g - (b*c^5*d^5*e^3 - 3*b*c^3*d^3*e^5
 + 2*b*c*d*e^7)*h)*x^2 + (4*b*c^5*d^5*e^3 - 5*b*c^3*d^3*e^5 + b*c*d*e^7)*f
- (b*c^5*d^6*e^2 + b*c^3*d^4*e^4 - 2*b*c*d^2*e^6)*g - (2*b*c^5*d^7*e - 7*b*
```

```
c^3*d^5*e^3 + 5*b*c*d^3*e^5)*h + ((7*b*c^5*d^4*e^4 - 8*b*c^3*d^2*e^6 + b*c*
e^8)*f - (b*c^5*d^5*e^3 + 4*b*c^3*d^3*e^5 - 5*b*c*d*e^7)*g - (5*b*c^5*d^6*e
^2 - 16*b*c^3*d^4*e^4 + 11*b*c*d^2*e^6)*h)*x))/(c^6*d^9*e^3 - 3*c^4*d^7*e^5
 + 3*c^2*d^5*e^7 - d^3*e^9 + (c^6*d^6*e^6 - 3*c^4*d^4*e^8 + 3*c^2*d^2*e^10
- e^12)*x^3 + 3*(c^6*d^7*e^5 - 3*c^4*d^5*e^7 + 3*c^2*d^3*e^9 - d*e^11)*x^2
+ 3*(c^6*d^8*e^4 - 3*c^4*d^6*e^6 + 3*c^2*d^4*e^8 - d^2*e^10)*x), -1/6*(6*(a
*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8)*h*x^2 - sqrt(c^2*
d^2 - e^2)*(((2*b*c^5*d^2*e^5 + b*c^3*e^7)*f + (b*c^5*d^3*e^4 - 4*b*c^3*d*e
^6)*g + (2*b*c^5*d^4*e^3 - 5*b*c^3*d^2*e^5 + 6*b*c*e^7)*h)*x^3 + 3*((2*b*c^
5*d^3*e^4 + b*c^3*d*e^6)*f + (b*c^5*d^4*e^3 - 4*b*c^3*d^2*e^5)*g + (2*b*c^5
*d^5*e^2 - 5*b*c^3*d^3*e^4 + 6*b*c*d*e^6)*h)*x^2 + (2*b*c^5*d^5*e^2 + b*c^3
*d^3*e^4)*f + (b*c^5*d^6*e - 4*b*c^3*d^4*e^3)*g + (2*b*c^5*d^7 - 5*b*c^3*d^
5*e^2 + 6*b*c*d^3*e^4)*h + 3*((2*b*c^5*d^4*e^3 + b*c^3*d^2*e^5)*f + (b*c^5*
d^5*e^2 - 4*b*c^3*d^3*e^4)*g + (2*b*c^5*d^6*e - 5*b*c^3*d^4*e^3 + 6*b*c*d^2
*e^5)*h)*x)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^
2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + 2*(a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^
4 + 3*a*c^2*d^2*e^6 - a*e^8)*f + (a*c^6*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d
^3*e^5 - a*d*e^7)*g + 2*(a*c^6*d^8 - 3*a*c^4*d^6*e^2 + 3*a*c^2*d^4*e^4 - a*
d^2*e^6)*h + 3*((a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8)
*g + 2*(a*c^6*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d^3*e^5 - a*d*e^7)*h)*x + (
6*(b*c^6*d^6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*h*x^2 + 2*(b*
c^6*d^6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*f + (b*c^6*d^7*e -
 3*b*c^4*d^5*e^3 + 3*b*c^2*d^3*e^5 - b*d*e^7)*g + 2*(b*c^6*d^8 - 3*b*c^4*d^
6*e^2 + 3*b*c^2*d^4*e^4 - b*d^2*e^6)*h + 3*((b*c^6*d^6*e^2 - 3*b*c^4*d^4*e^
4 + 3*b*c^2*d^2*e^6 - b*e^8)*g + 2*(b*c^6*d^7*e - 3*b*c^4*d^5*e^3 + 3*b*c^2
*d^3*e^5 - b*d*e^7)*h)*x)*arcsin(c*x) - sqrt(-c^2*x^2 + 1)*(3*((b*c^5*d^3*e
^5 - b*c^3*d*e^7)*f - (b*c^3*d^2*e^6 - b*c*e^8)*g - (b*c^5*d^5*e^3 - 3*b*c^
3*d^3*e^5 + 2*b*c*d*e^7)*h)*x^2 + (4*b*c^5*d^5*e^3 - 5*b*c^3*d^3*e^5 + b*c*
d*e^7)*f - (b*c^5*d^6*e^2 + b*c^3*d^4*e^4 - 2*b*c*d^2*e^6)*g - (2*b*c^5*d^7
*e - 7*b*c^3*d^5*e^3 + 5*b*c*d^3*e^5)*h + ((7*b*c^5*d^4*e^4 - 8*b*c^3*d^2*e
^6 + b*c*e^8)*f - (b*c^5*d^5*e^3 + 4*b*c^3*d^3*e^5 - 5*b*c*d*e^7)*g - (5*b*
c^5*d^6*e^2 - 16*b*c^3*d^4*e^4 + 11*b*c*d^2*e^6)*h)*x))/(c^6*d^9*e^3 - 3*c^
4*d^7*e^5 + 3*c^2*d^5*e^7 - d^3*e^9 + (c^6*d^6*e^6 - 3*c^4*d^4*e^8 + 3*c^2*
d^2*e^10 - e^12)*x^3 + 3*(c^6*d^7*e^5 - 3*c^4*d^5*e^7 + 3*c^2*d^3*e^9 - d*e
^11)*x^2 + 3*(c^6*d^8*e^4 - 3*c^4*d^6*e^6 + 3*c^2*d^4*e^8 - d^2*e^10)*x)]
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^4}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")

[Out] -1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*h/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((6*b*e^2*h*x^2 + 2*b*e^2*f + b*d*e*g + 2*b*d^2*h + 3*(b*e^2*g + 2*b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)*integrate(1/6*(6*b*c*e^2*h*x^2 + 2*b*c*e^2*f + b*c*d*e*g + 2*b*c*d^2*h + 3*(b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^6*x^7 + 3*c^4*d*e^5*x^6 - 3*c^2*d^2*e^4*x^3 - c^2*d^3*e^3*x^2 + (3*c^4*d^2*e^4 - c^2*e^6)*x^5 + (c^4*d^3*e^3 - 3*c^2*d*e^5)*x^4 + (c^2*e^6*x^5 + 3*c^2*d*e^5*x^4 - 3*d^2*e^4*x - d^3*e^3 + (3*c^2*d^2*e^4 - e^6)*x^3 + (c^2*d^3*e^3 - 3*d*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)

Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")

[Out] integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^4}\,dx$$

[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4,x)

[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4, x)

3.104 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5} dx$

Optimal result

Integrand size = 26, antiderivative size = 470

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5} dx \\
&= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} \\
&\quad + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} \\
&\quad - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} \\
&\quad - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} \\
&\quad - \frac{bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^3(c^2d^2-e^2)^{7/2}}
\end{aligned}$$

```
[Out] -1/4*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^4-1/3*(-2*d*h+e*g)*(
a+b*arcsin(c*x))/e^3/(e*x+d)^3-1/2*h*(a+b*arcsin(c*x))/e^3/(e*x+d)^2-1/24*b
*c^3*(4*e^4*(-5*d*h+e*g)-c^2*d*e^2*(-7*d^2*h-13*d*e*g+9*e^2*f)-2*c^4*d^3*(d
^2*h+d*e*g+3*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e^3/(c^2*d^2-e^2)^(7/2)+1/12*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2
)/e^2/(c^2*d^2-e^2)/(e*x+d)^3-1/24*b*c*(4*e^2*(-2*d*h+e*g)-c^2*d*(-3*d^2*h-
d*e*g+5*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)^2+1/24*b*c*(
12*e^4*h+c^4*d^2*(-d^2*h+d*e*g+11*e^2*f)+4*c^2*e^2*(d^2*h-4*d*e*g+e^2*f))*(
-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)^3/(e*x+d)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 470, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {712, 4837, 12, 1665, 849, 821, 739, 210}

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = -\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{bc^3\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(-2c^4d^3(d^2h+deg+3e^2f)-c^2de^2(-7d^2h-13deg+9e^2f)+4e^4(eg-5}{24e^3(c^2d^2-e^2)^{7/2}} - \frac{bc\sqrt{1-c^2x^2}(4e^2(eg-2dh)-c^2d(-3d^2h-deg+5e^2f))}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{12e^2(c^2d^2-e^2)(d+ex)^3} + \frac{bc\sqrt{1-c^2x^2}(c^4d^2(d^2(-h)+deg+11e^2f)+4c^2e^2(d^2h-4deg+e^2f)+12e^4h)}{24e^2(c^2d^2-e^2)^3(d+ex)}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

```
[Out] (b*c*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/(12*e^2*(c^2*d^2 - e^2)*(d
+ e*x)^3) - (b*c*(4*e^2*(e*g - 2*d*h) - c^2*d*(5*e^2*f - d*e*g - 3*d^2*h))*
Sqrt[1 - c^2*x^2])/(24*e^2*(c^2*d^2 - e^2)^2*(d + e*x)^2) + (b*c*(12*e^4*h
+ c^4*d^2*(11*e^2*f + d*e*g - d^2*h) + 4*c^2*e^2*(e^2*f - 4*d*e*g + d^2*h))
*Sqrt[1 - c^2*x^2])/(24*e^2*(c^2*d^2 - e^2)^3*(d + e*x)) - ((e^2*f - d*e*g
+ d^2*h)*(a + b*ArcSin[c*x]))/(4*e^3*(d + e*x)^4) - ((e*g - 2*d*h)*(a + b*A
rcSin[c*x]))/(3*e^3*(d + e*x)^3) - (h*(a + b*ArcSin[c*x]))/(2*e^3*(d + e*x)
^2) - (b*c^3*(4*e^4*(e*g - 5*d*h) - c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h
) - 2*c^4*d^3*(3*e^2*f + d*e*g + d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2
 - e^2]*Sqrt[1 - c^2*x^2])])/(24*e^3*(c^2*d^2 - e^2)^(7/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
```

```
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\left(e^2 f - deg + d^2 h\right)(a + b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad - \frac{h(a + b\arcsin(cx))}{2e^3(d+ex)^2} - (bc)\int \frac{-3e^2 f - deg - d^2 h - 4e(eg+dh)x - 6e^2 h x^2}{12e^3(d+ex)^4\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{\left(e^2 f - deg + d^2 h\right)(a + b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg - 2dh)(a + b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad - \frac{h(a + b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(bc)\int \frac{-3e^2 f - deg - d^2 h - 4e(eg+dh)x - 6e^2 h x^2}{(d+ex)^4\sqrt{1-c^2x^2}}\,dx}{12e^3} \\
&= \frac{bc\left(e^2 f - deg + d^2 h\right)\sqrt{1-c^2x^2}}{12e^2\left(c^2d^2 - e^2\right)(d+ex)^3} - \frac{\left(e^2 f - deg + d^2 h\right)(a + b\arcsin(cx))}{4e^3(d+ex)^4} \\
&\quad - \frac{(eg - 2dh)(a + b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a + b\arcsin(cx))}{2e^3(d+ex)^2} \\
&\quad - \frac{(bc)\int \frac{3\left(2e^2(2eg-dh) - c^2 d\left(3e^2 f + deg + d^2 h\right)\right) + 6e\left(3e^2 h + c^2\left(e^2 f - deg - 2d^2 h\right)\right)x}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{36e^3\left(c^2d^2 - e^2\right)} \\
&= \frac{bc\left(e^2 f - deg + d^2 h\right)\sqrt{1-c^2x^2}}{12e^2\left(c^2d^2 - e^2\right)(d+ex)^3} \\
&\quad - \frac{bc\left(4e^2(eg - 2dh) - c^2 d\left(5e^2 f - deg - 3d^2 h\right)\right)\sqrt{1-c^2x^2}}{24e^2\left(c^2d^2 - e^2\right)^2(d+ex)^2} \\
&\quad - \frac{\left(e^2 f - deg + d^2 h\right)(a + b\arcsin(cx))}{4e^3(d+ex)^4} \\
&\quad - \frac{(eg - 2dh)(a + b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a + b\arcsin(cx))}{2e^3(d+ex)^2} \\
&\quad - \frac{(bc)\int \frac{-6\left(6e^4 h + 2c^2e^2\left(e^2 f - 3deg - d^2 h\right) + c^4 d^2\left(3e^2 f + deg + d^2 h\right)\right) - 3c^2 e\left(4e^2(eg-2dh) - c^2 d\left(5e^2 f - deg - 3d^2 h\right)\right)x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{72e^3\left(c^2d^2 - e^2\right)^2}
\end{aligned}
$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}d}{24e^3(c^2d^2-e^2)^3}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} + \frac{(bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h)))\text{Subst}\left(\int\frac{1}{-c^2d^2+e}\right.}{24e^3(c^2d^2-e^2)^3}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1}}\right.}{24e^3(c^2d^2-e^2)^{7/2}}$$

Mathematica [A] (verified)

Time = 3.06 (sec) , antiderivative size = 575, normalized size of antiderivative = 1.22

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx =$$

$$-\frac{\frac{6a(e^2f-deg+d^2h)}{(d+ex)^4}+\frac{8a(eg-2dh)}{(d+ex)^3}+\frac{12ah}{(d+ex)^2}+\frac{bce\sqrt{1-c^2x^2}(c^4d^2(-2d^4h+11e^4fx^2+de^3x(27f+gx)-d^3e(2g+5hx)+d^2e^2(18f+x(g-h}{}}{}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

```
[Out] -1/24*((6*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^4 + (8*a*(e*g - 2*d*h))/(d +
 e*x)^3 + (12*a*h)/(d + e*x)^2 + (b*c*e*Sqrt[1 - c^2*x^2]*(c^4*d^2*(-2*d^4*
h + 11*e^4*f*x^2 + d*e^3*x*(27*f + g*x) - d^3*e*(2*g + 5*h*x) + d^2*e^2*(18
*f + x*(g - h*x))) + 2*e^4*(3*d^2*h + d*e*(g + 8*h*x) + e^2*(f + 2*x*(g + 3
*h*x))) + c^2*e^2*(11*d^4*h + 4*e^4*f*x^2 + d*e^3*x*(3*f - 16*g*x) + d^3*e*
(-15*g + 19*h*x) + d^2*e^2*(-5*f + x*(-35*g + 4*h*x)))))/((-(c^2*d^2) + e^2
)^3*(d + e*x)^3) + (2*b*(d^2*h + d*e*(g + 4*h*x) + e^2*(3*f + 4*g*x + 6*h*x
^2))*ArcSin[c*x])/(d + e*x)^4 - (b*c^3*(-4*e^4*(e*g - 5*d*h) + c^2*d*e^2*(9
*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d^3*(3*e^2*f + d*e*g + d^2*h))*Log[d +
 e*x])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*(-4*e^4*(e
*g - 5*d*h) + c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d^3*(3*e^2*f
 + d*e*g + d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^
2]])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1923 vs. 2(444) = 888.

Time = 4.60 (sec) , antiderivative size = 1924, normalized size of antiderivative = 4.09

method	result	size
parts	Expression too large to display	1924
derivativedivides	Expression too large to display	1935
default	Expression too large to display	1935

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/4*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^4-1/3*(-2*d*h+e*g)/e^3/(e*x+d)^3-1/
2/e^3*h/(e*x+d)^2)+b/c*(2/3*c^4*arcsin(c*x)/e^3/(c*e*x+c*d)^3*d*h-1/3*c^4*a
rcsin(c*x)*g/e^2/(c*e*x+c*d)^3-1/2*c^3*arcsin(c*x)/e^3*h/(c*e*x+c*d)^2-1/4*
c^5*arcsin(c*x)/e^3/(c*e*x+c*d)^4*d^2*h+1/4*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)
^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*f+1/12*c^3/e^3*(6*h/e^2*(1/(c^2*
d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/
e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e
```

```
^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*
d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-4*c*(2*d*h-e*g)/e
^3*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)
-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x
+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/
(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(
c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)
-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e
^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^
2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))
/(c*x+d*c/e)))+3*c^2*(d^2*h-d*e*g+e^2*f)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*
c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c
*e/(c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c
/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2
-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2
)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)
/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c
/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^
2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2
*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^
2)/e^2)^(1/2))/(c*x+d*c/e)))-2/3/(c^2*d^2-e^2)*e^2*(1/(c^2*d^2-e^2)*e^2/(c*
x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e
/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*
(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e
)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2145 vs. $2(442) = 884$.

Time = 246.85 (sec) , antiderivative size = 4316, normalized size of antiderivative = 9.18

$$\int \frac{(f + gx + hx^2)\,(a + b\arcsin(cx))}{(d + ex)^5}\,dx = \text{Too large to display}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

```
[Out] [-1/48*(24*(a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2
*e^8 + a*e^10)*h*x^2 - ((3*(2*b*c^7*d^3*e^6 + 3*b*c^5*d*e^8)*f + (2*b*c^7*d
^4*e^5 - 13*b*c^5*d^2*e^7 - 4*b*c^3*e^9)*g + (2*b*c^7*d^5*e^4 - 7*b*c^5*d^3
*e^6 + 20*b*c^3*d*e^8)*h)*x^4 + 4*(3*(2*b*c^7*d^4*e^5 + 3*b*c^5*d^2*e^7)*f
+ (2*b*c^7*d^5*e^4 - 13*b*c^5*d^3*e^6 - 4*b*c^3*d*e^8)*g + (2*b*c^7*d^6*e^3
 - 7*b*c^5*d^4*e^5 + 20*b*c^3*d^2*e^7)*h)*x^3 + 6*(3*(2*b*c^7*d^5*e^4 + 3*b
*c^5*d^3*e^6)*f + (2*b*c^7*d^6*e^3 - 13*b*c^5*d^4*e^5 - 4*b*c^3*d^2*e^7)*g
+ (2*b*c^7*d^7*e^2 - 7*b*c^5*d^5*e^4 + 20*b*c^3*d^3*e^6)*h)*x^2 + 3*(2*b*c^
7*d^7*e^2 + 3*b*c^5*d^5*e^4)*f + (2*b*c^7*d^8*e - 13*b*c^5*d^6*e^3 - 4*b*c^
```

3*d^4*e^5)*g + (2*b*c^7*d^9 - 7*b*c^5*d^7*e^2 + 20*b*c^3*d^5*e^4)*h + 4*(3*(2*b*c^7*d^6*e^3 + 3*b*c^5*d^4*e^5)*f + (2*b*c^7*d^7*e^2 - 13*b*c^5*d^5*e^4 - 4*b*c^3*d^3*e^6)*g + (2*b*c^7*d^8*e - 7*b*c^5*d^6*e^3 + 20*b*c^3*d^4*e^5)*h)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 12*(a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^8 + a*e^10)*f + 4*(a*c^8*d^9*e - 4*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*a*c^2*d^3*e^7 + a*d*e^9)*g + 4*(a*c^8*d^10 - 4*a*c^6*d^8*e^2 + 6*a*c^4*d^6*e^4 - 4*a*c^2*d^4*e^6 + a*d^2*e^8)*h + 16*((a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^8 + a*e^10)*g + (a*c^8*d^9*e - 4*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*a*c^2*d^3*e^7 + a*d*e^9)*h)*x + 4*(6*(b*c^8*d^8*e^2 - 4*b*c^6*d^6*e^4 + 6*b*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*e^10)*h*x^2 + 3*(b*c^8*d^8*e^2 - 4*b*c^6*d^6*e^4 + 6*b*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*e^10)*f + (b*c^8*d^9*e - 4*b*c^6*d^7*e^3 + 6*b*c^4*d^5*e^5 - 4*b*c^2*d^3*e^7 + b*d*e^9)*g + (b*c^8*d^10 - 4*b*c^6*d^8*e^2 + 6*b*c^4*d^6*e^4 - 4*b*c^2*d^4*e^6 + b*d^2*e^8)*h + 4*((b*c^8*d^8*e^2 - 4*b*c^6*d^6*e^4 + 6*b*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*e^10)*g + (b*c^8*d^9*e - 4*b*c^6*d^7*e^3 + 6*b*c^4*d^5*e^5 - 4*b*c^2*d^3*e^7 + b*d*e^9)*h)*x)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^6 - 7*b*c^5*d^2*e^8 - 4*b*c^3*e^10)*f + (b*c^7*d^5*e^5 - 17*b*c^5*d^3*e^7 + 16*b*c^3*d*e^9)*g - (b*c^7*d^6*e^4 - 5*b*c^5*d^4*e^6 - 8*b*c^3*d^2*e^8 + 12*b*c*e^10)*h)*x^3 + ((38*b*c^7*d^5*e^5 - 31*b*c^5*d^3*e^7 - 7*b*c^3*d*e^9)*f + (2*b*c^7*d^6*e^4 - 53*b*c^5*d^4*e^6 + 55*b*c^3*d^2*e^8 - 4*b*c*e^10)*g - (6*b*c^7*d^7*e^3 - 29*b*c^5*d^5*e^5 - 5*b*c^3*d^3*e^7 + 28*b*c*d*e^9)*h)*x^2 + (18*b*c^7*d^7*e^3 - 23*b*c^5*d^5*e^5 + 7*b*c^3*d^3*e^7 - 2*b*c*d*e^9)*f - (2*b*c^7*d^8*e^2 + 13*b*c^5*d^6*e^4 - 17*b*c^3*d^4*e^6 + 2*b*c*d^2*e^8)*g - (2*b*c^7*d^9*e - 13*b*c^5*d^7*e^3 + 5*b*c^3*d^5*e^5 + 6*b*c*d^3*e^7)*h + ((45*b*c^7*d^6*e^4 - 47*b*c^5*d^4*e^6 + 4*b*c^3*d^2*e^8 - 2*b*c*e^10)*f - (b*c^7*d^7*e^3 + 49*b*c^5*d^5*e^5 - 56*b*c^3*d^3*e^7 + 6*b*c*d*e^9)*g - (7*b*c^7*d^8*e^2 - 37*b*c^5*d^6*e^4 + 8*b*c^3*d^4*e^6 + 22*b*c*d^2*e^8)*h)*x))/(c^8*d^12*e^3 - 4*c^6*d^10*e^5 + 6*c^4*d^8*e^7 - 4*c^2*d^6*e^9 + d^4*e^11 + (c^8*d^8*e^7 - 4*c^6*d^6*e^9 + 6*c^4*d^4*e^11 - 4*c^2*d^2*e^13 + e^15)*x^4 + 4*(c^8*d^9*e^6 - 4*c^6*d^7*e^8 + 6*c^4*d^5*e^10 - 4*c^2*d^3*e^12 + d*e^14)*x^3 + 6*(c^8*d^10*e^5 - 4*c^6*d^8*e^7 + 6*c^4*d^6*e^9 - 4*c^2*d^4*e^11 + d^2*e^13)*x^2 + 4*(c^8*d^11*e^4 - 4*c^6*d^9*e^6 + 6*c^4*d^7*e^8 - 4*c^2*d^5*e^10 + d^3*e^12)*x),
-1/24*(12*(a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^8 + a*e^10)*h*x^2 - ((3*(2*b*c^7*d^3*e^6 + 3*b*c^5*d*e^8)*f + (2*b*c^7*d^4*e^5 - 13*b*c^5*d^2*e^7 - 4*b*c^3*e^9)*g + (2*b*c^7*d^5*e^4 - 7*b*c^5*d^3*e^6 + 20*b*c^3*d*e^8)*h)*x^4 + 4*(3*(2*b*c^7*d^4*e^5 + 3*b*c^5*d^2*e^7)*f + (2*b*c^7*d^5*e^4 - 13*b*c^5*d^3*e^6 - 4*b*c^3*d*e^8)*g + (2*b*c^7*d^6*e^3 - 7*b*c^5*d^4*e^5 + 20*b*c^3*d^2*e^7)*h)*x^3 + 6*(3*(2*b*c^7*d^5*e^4 + 3*b*c^5*d^3*e^6)*f + (2*b*c^7*d^6*e^3 - 13*b*c^5*d^4*e^5 - 4*b*c^3*d^2*e^7)*g + (2*b*c^7*d^7*e^2 - 7*b*c^5*d^5*e^4 + 20*b*c^3*d^3*e^6)*h)*x^2 + 3*(2*b*c^7*d^7*e^2 + 3*b*c^5*d^5*e^4)*f + (2*b*c^7*d^8*e - 13*b*c^5*d^6*e^3 - 4*b*c^3*d^4*e^5)*g + (2*b*c^7*d^9 - 7*b*c^5*d^7*e^2 + 20*b*c^3*d^5*e^4)*h + 4*(3*(

```
2*b*c^7*d^6*e^3 + 3*b*c^5*d^4*e^5)*f + (2*b*c^7*d^7*e^2 - 13*b*c^5*d^5*e^4
- 4*b*c^3*d^3*e^6)*g + (2*b*c^7*d^8*e - 7*b*c^5*d^6*e^3 + 20*b*c^3*d^4*e^5)
*h)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c
^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + 6*(a*c^8*d^8*e^2 -
 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^8 + a*e^10)*f + 2*(a*c^8
*d^9*e - 4*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*a*c^2*d^3*e^7 + a*d*e^9)*g +
 2*(a*c^8*d^10 - 4*a*c^6*d^8*e^2 + 6*a*c^4*d^6*e^4 - 4*a*c^2*d^4*e^6 + a*d^
2*e^8)*h + 8*((a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*
d^2*e^8 + a*e^10)*g + (a*c^8*d^9*e - 4*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*
a*c^2*d^3*e^7 + a*d*e^9)*h)*x + 2*(6*(b*c^8*d^8*e^2 - 4*b*c^6*d^6*e^4 + 6*b
*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*e^10)*h*x^2 + 3*(b*c^8*d^8*e^2 - 4*b*c^6
*d^6*e^4 + 6*b*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*e^10)*f + (b*c^8*d^9*e - 4
*b*c^6*d^7*e^3 + 6*b*c^4*d^5*e^5 - 4*b*c^2*d^3*e^7 + b*d*e^9)*g + (b*c^8*d^
10 - 4*b*c^6*d^8*e^2 + 6*b*c^4*d^6*e^4 - 4*b*c^2*d^4*e^6 + b*d^2*e^8)*h + 4
*((b*c^8*d^8*e^2 - 4*b*c^6*d^6*e^4 + 6*b*c^4*d^4*e^6 - 4*b*c^2*d^2*e^8 + b*
e^10)*g + (b*c^8*d^9*e - 4*b*c^6*d^7*e^3 + 6*b*c^4*d^5*e^5 - 4*b*c^2*d^3*e^
7 + b*d*e^9)*h)*x)*arcsin(c*x) - sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^6 - 7
*b*c^5*d^2*e^8 - 4*b*c^3*e^10)*f + (b*c^7*d^5*e^5 - 17*b*c^5*d^3*e^7 + 16*b
*c^3*d*e^9)*g - (b*c^7*d^6*e^4 - 5*b*c^5*d^4*e^6 - 8*b*c^3*d^2*e^8 + 12*b*c
*e^10)*h)*x^3 + ((38*b*c^7*d^5*e^5 - 31*b*c^5*d^3*e^7 - 7*b*c^3*d*e^9)*f +
(2*b*c^7*d^6*e^4 - 53*b*c^5*d^4*e^6 + 55*b*c^3*d^2*e^8 - 4*b*c*e^10)*g - (6
*b*c^7*d^7*e^3 - 29*b*c^5*d^5*e^5 - 5*b*c^3*d^3*e^7 + 28*b*c*d*e^9)*h)*x^2
+ (18*b*c^7*d^7*e^3 - 23*b*c^5*d^5*e^5 + 7*b*c^3*d^3*e^7 - 2*b*c*d*e^9)*f -
 (2*b*c^7*d^8*e^2 + 13*b*c^5*d^6*e^4 - 17*b*c^3*d^4*e^6 + 2*b*c*d^2*e^8)*g
- (2*b*c^7*d^9*e - 13*b*c^5*d^7*e^3 + 5*b*c^3*d^5*e^5 + 6*b*c*d^3*e^7)*h +
((45*b*c^7*d^6*e^4 - 47*b*c^5*d^4*e^6 + 4*b*c^3*d^2*e^8 - 2*b*c*e^10)*f - (
b*c^7*d^7*e^3 + 49*b*c^5*d^5*e^5 - 56*b*c^3*d^3*e^7 + 6*b*c*d*e^9)*g - (7*b
*c^7*d^8*e^2 - 37*b*c^5*d^6*e^4 + 8*b*c^3*d^4*e^6 + 22*b*c*d^2*e^8)*h)*x))/
(c^8*d^12*e^3 - 4*c^6*d^10*e^5 + 6*c^4*d^8*e^7 - 4*c^2*d^6*e^9 + d^4*e^11 +
 (c^8*d^8*e^7 - 4*c^6*d^6*e^9 + 6*c^4*d^4*e^11 - 4*c^2*d^2*e^13 + e^15)*x^4
 + 4*(c^8*d^9*e^6 - 4*c^6*d^7*e^8 + 6*c^4*d^5*e^10 - 4*c^2*d^3*e^12 + d*e^1
4)*x^3 + 6*(c^8*d^10*e^5 - 4*c^6*d^8*e^7 + 6*c^4*d^6*e^9 - 4*c^2*d^4*e^11 +
 d^2*e^13)*x^2 + 4*(c^8*d^11*e^4 - 4*c^6*d^9*e^6 + 6*c^4*d^7*e^8 - 4*c^2*d^
5*e^10 + d^3*e^12)*x)]
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^5}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\,(f+gx+hx^2)}{(d+ex)^5}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**5, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

```
[Out] -1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
+ d^4*e^2) - 1/12*(6*e^2*x^2 + 4*d*e*x + d^2)*a*h/(e^7*x^4 + 4*d*e^6*x^3 +
6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3 + 6
*d^2*e^3*x^2 + 4*d^3*e^2*x + d^4*e) - 1/12*((6*b*e^2*h*x^2 + 3*b*e^2*f + b*
d*e*g + b*d^2*h + 4*(b*e^2*g + b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)) + 12*(e^7*x^4 + 4*d*e^6*x^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*
e^3)*integrate(1/12*(6*b*c*e^2*h*x^2 + 3*b*c*e^2*f + b*c*d*e*g + b*c*d^2*h
+ 4*(b*c*e^2*g + b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^
4*e^7*x^8 + 4*c^4*d*e^6*x^7 - 4*c^2*d^3*e^4*x^3 - c^2*d^4*e^3*x^2 + (6*c^4*
d^2*e^5 - c^2*e^7)*x^6 + 4*(c^4*d^3*e^4 - c^2*d*e^6)*x^5 + (c^4*d^4*e^3 - 6
*c^2*d^2*e^5)*x^4 + (c^2*e^7*x^6 + 4*c^2*d*e^6*x^5 - 4*d^3*e^4*x - d^4*e^3
+ (6*c^2*d^2*e^5 - e^7)*x^4 + 4*(c^2*d^3*e^4 - d*e^6)*x^3 + (c^2*d^4*e^3 -
6*d^2*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^7*x^4 + 4*d*e^6*x
^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^5}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5,x)
```

```
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5, x)
```

3.105 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 593

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4}$$
$$-\frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3}$$
$$+\frac{bc(20e^4h+c^4d^2(26e^2f-deg-4d^2h)+c^2e^2(9e^2f-34deg+19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2}$$
$$+\frac{bc^3(c^4d^3(10ef+dg)-4e^3(eg-5dh)+c^2de(11e^2f-18deg+d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)}$$
$$-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{5e^3(d+ex)^5}$$
$$-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$
$$+\frac{bc^3(20e^6h+3c^4d^2e^2(24e^2f-19deg-6d^2h)+2c^6d^4(12e^2f+3deg+2d^2h)+9c^2e^4(e^2f-6deg+11d^2h}{120e^3(c^2d^2-e^2)^{9/2}}$$

```
[Out] -1/5*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^5-1/4*(-2*d*h+e*g)*(
a+b*arcsin(c*x))/e^3/(e*x+d)^4-1/3*h*(a+b*arcsin(c*x))/e^3/(e*x+d)^3+1/120*
b*c^3*(20*e^6*h+3*c^4*d^2*e^2*(-6*d^2*h-19*d*e*g+24*e^2*f)+2*c^6*d^4*(2*d^2
*h+3*d*e*g+12*e^2*f)+9*c^2*e^4*(11*d^2*h-6*d*e*g+e^2*f))*arctan((c^2*d*x+e)
/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(9/2)+1/20*b*c*(
d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^4-1/60*b*c*
(5*e^2*(-2*d*h+e*g)-c^2*d*(-3*d^2*h-2*d*e*g+7*e^2*f))*(-c^2*x^2+1)^(1/2)/e^
2/(c^2*d^2-e^2)^2/(e*x+d)^3+1/120*b*c*(20*e^4*h+c^4*d^2*(-4*d^2*h-d*e*g+26*
e^2*f)+c^2*e^2*(19*d^2*h-34*d*e*g+9*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2
```

```
-e^2)^3/(e*x+d)^2+1/24*b*c^3*(c^4*d^3*(d*g+10*e*f)-4*e^3*(-5*d*h+e*g)+c^2*d
*e*(d^2*h-18*d*e*g+11*e^2*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^4/(e*x+d)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 593, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {712, 4837, 12, 1665, 849, 821, 739, 210}

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = -\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{5e^3(d+ex)^5}$$
$$-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$
$$+\frac{bc^3\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(2c^6d^4(2d^2h+3deg+12e^2f)+3c^4d^2e^2(-6d^2h-19deg+24e^2f)+9c^2e^4(}{120e^3(c^2d^2-e^2)^{9/2}}$$
$$-\frac{bc\sqrt{1-c^2x^2}(5e^2(eg-2dh)-c^2d(-3d^2h-2deg+7e^2f))}{60e^2(c^2d^2-e^2)^2(d+ex)^3}$$
$$+\frac{bc\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{20e^2(c^2d^2-e^2)(d+ex)^4}$$
$$+\frac{bc\sqrt{1-c^2x^2}(c^4d^2(-4d^2h-deg+26e^2f)+c^2e^2(19d^2h-34deg+9e^2f)+20e^4h)}{120e^2(c^2d^2-e^2)^3(d+ex)^2}$$
$$+\frac{bc^3\sqrt{1-c^2x^2}(c^4d^3(dg+10ef)+c^2de(d^2h-18deg+11e^2f)-4e^3(eg-5dh))}{24e(c^2d^2-e^2)^4(d+ex)}$$

```
[In] Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

```
[Out] (b*c*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/(20*e^2*(c^2*d^2 - e^2)*(d
+ e*x)^4) - (b*c*(5*e^2*(e*g - 2*d*h) - c^2*d*(7*e^2*f - 2*d*e*g - 3*d^2*h)
)*Sqrt[1 - c^2*x^2])/(60*e^2*(c^2*d^2 - e^2)^2*(d + e*x)^3) + (b*c*(20*e^4*
h + c^4*d^2*(26*e^2*f - d*e*g - 4*d^2*h) + c^2*e^2*(9*e^2*f - 34*d*e*g + 19
*d^2*h))*Sqrt[1 - c^2*x^2])/(120*e^2*(c^2*d^2 - e^2)^3*(d + e*x)^2) + (b*c^
3*(c^4*d^3*(10*e*f + d*g) - 4*e^3*(e*g - 5*d*h) + c^2*d*e*(11*e^2*f - 18*d*
e*g + d^2*h))*Sqrt[1 - c^2*x^2])/(24*e*(c^2*d^2 - e^2)^4*(d + e*x)) - ((e^2
*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(5*e^3*(d + e*x)^5) - ((e*g - 2*d*
h)*(a + b*ArcSin[c*x]))/(4*e^3*(d + e*x)^4) - (h*(a + b*ArcSin[c*x]))/(3*e^
3*(d + e*x)^3) + (b*c^3*(20*e^6*h + 3*c^4*d^2*e^2*(24*e^2*f - 19*d*e*g - 6*
d^2*h) + 2*c^6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*
e*g + 11*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2
])])/(120*e^3*(c^2*d^2 - e^2)^(9/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
```

```
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad -(bc)\int \frac{-12e^2f-3deg-2d^2h-5e(3eg+2dh)x-20e^2hx^2}{60e^3(d+ex)^5\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} \\
&\quad - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(bc)\int \frac{-12e^2f-3deg-2d^2h-5e(3eg+2dh)x-20e^2hx^2}{(d+ex)^5\sqrt{1-c^2x^2}}\,dx}{60e^3} \\
&= \frac{bc(e^2f-deg+d^2h)\,\sqrt{1-c^2x^2}}{20e^2\,(c^2d^2-e^2)\,(d+ex)^4} - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{5e^3(d+ex)^5} \\
&\quad - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad - \frac{(bc)\int \frac{4(5e^2(3eg-2dh)-c^2d(12e^2f+3deg+2d^2h))+4e(20e^2h+c^2(9e^2f-9deg-11d^2h))x}{(d+ex)^4\sqrt{1-c^2x^2}}\,dx}{240e^3\,(c^2d^2-e^2)} \\
&= \frac{bc(e^2f-deg+d^2h)\,\sqrt{1-c^2x^2}}{20e^2\,(c^2d^2-e^2)\,(d+ex)^4} \\
&\quad - \frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\,\sqrt{1-c^2x^2}}{60e^2\,(c^2d^2-e^2)^2\,(d+ex)^3} \\
&\quad - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{5e^3(d+ex)^5} \\
&\quad - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad - \frac{(bc)\int \frac{-12(20e^4h+c^2e^2(9e^2f-24deg-d^2h)+c^4d^2(12e^2f+3deg+2d^2h))-24c^2e(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))x}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{720e^3\,(c^2d^2-e^2)^2}
\end{aligned}
$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2(eg-2dh) - c^2d(7e^2f - 2deg - 3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc(20e^4h + c^4d^2(26e^2f - deg - 4d^2h) + c^2e^2(9e^2f - 34deg + 19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2} - \frac{(e^2f - deg + d^2h)(a + b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(bc)\int \frac{24c^2(10e^4(eg-4dh) - c^2de^2(23e^2f - 28deg - 7d^2h) - c^4d^3(12e^2f + 3deg + 2d^2h)) + 12c^2e(20e^4h + c^4d^2(26e^2f - deg - 4d^2h) + c^2}{(d+ex)^2\sqrt{1-c^2x^2}}}{1440e^3(c^2d^2-e^2)^3}$$

$$= \frac{bc(e^2f - deg + d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2(eg-2dh) - c^2d(7e^2f - 2deg - 3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc(20e^4h + c^4d^2(26e^2f - deg - 4d^2h) + c^2e^2(9e^2f - 34deg + 19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2} + \frac{bc^3(c^4d^3(10ef + dg) - 4e^3(eg - 5dh) + c^2de(11e^2f - 18deg + d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} - \frac{(e^2f - deg + d^2h)(a + b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} + \frac{(bc^3(20e^6h + 3c^4d^2e^2(24e^2f - 19deg - 6d^2h) + 2c^6d^4(12e^2f + 3deg + 2d^2h) + 9c^2e^4(e^2f - 6deg}{120e^3(c^2d^2-e^2)^4}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc(20e^4h+c^4d^2(26e^2f-deg-4d^2h)+c^2e^2(9e^2f-34deg+19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2} + \frac{bc^3(c^4d^3(10ef+dg)-4e^3(eg-5dh)+c^2de(11e^2f-18deg+d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(bc^3(20e^6h+3c^4d^2e^2(24e^2f-19deg-6d^2h)+2c^6d^4(12e^2f+3deg+2d^2h)+9c^2e^4(e^2f-6de}{120e^3(c^2d^2-e^2)^4}$$

$$= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3} + \frac{bc(20e^4h+c^4d^2(26e^2f-deg-4d^2h)+c^2e^2(9e^2f-34deg+19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2} + \frac{bc^3(c^4d^3(10ef+dg)-4e^3(eg-5dh)+c^2de(11e^2f-18deg+d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{5e^3(d+ex)^5} - \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} + \frac{bc^3(20e^6h+3c^4d^2e^2(24e^2f-19deg-6d^2h)+2c^6d^4(12e^2f+3deg+2d^2h)+9c^2e^4(e^2f-6deg}{120e^3(c^2d^2-e^2)^{9/2}}$$

Mathematica [A] (verified)

Time = 2.86 (sec) , antiderivative size = 682, normalized size of antiderivative = 1.15

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = -\frac{\frac{24a(e^2f-deg+d^2h)}{(d+ex)^5}+\frac{30a(eg-2dh)}{(d+ex)^4}+\frac{40ah}{(d+ex)^3}-\frac{bce\sqrt{1-c^2x^2}\left(6(c^2d^2-e^2)^3(e^2f-deg+d^2h)-2(-c^2d^2+e^2)^2(5e^2(eg-2dh)+c^2d(-7e}{}}{}$$

```
[In] Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

```
[Out] -1/120*((24*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^5 + (30*a*(e*g - 2*d*h))/(
d + e*x)^4 + (40*a*h)/(d + e*x)^3 - (b*c*e*Sqrt[1 - c^2*x^2]*(6*(c^2*d^2 -
e^2)^3*(e^2*f - d*e*g + d^2*h) - 2*(-(c^2*d^2) + e^2)^2*(5*e^2*(e*g - 2*d*h
) + c^2*d*(-7*e^2*f + 2*d*e*g + 3*d^2*h))*(d + e*x) - (-(c^2*d^2) + e^2)*(2
0*e^4*h - c^4*d^2*(-26*e^2*f + d*e*g + 4*d^2*h) + c^2*e^2*(9*e^2*f - 34*d*e
*g + 19*d^2*h))*(d + e*x)^2 + 5*c^2*e*(c^4*d^3*(10*e*f + d*g) - 4*e^3*(e*g
- 5*d*h) + c^2*d*e*(11*e^2*f - 18*d*e*g + d^2*h))*(d + e*x)^3))/((-(c^2*d^2
) + e^2)^4*(d + e*x)^4) + (2*b*(2*d^2*h + d*e*(3*g + 10*h*x) + e^2*(12*f +
5*x*(3*g + 4*h*x)))*ArcSin[c*x])/(d + e*x)^5 - (b*c^3*(20*e^6*h + 2*c^6*d^4
*(12*e^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d*e*g + 6*d
^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[d + e*x])/((-(c*d) + e)
^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*(20*e^6*h + 2*c^6*d^4*(12*e
^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d*e*g + 6*d^2*h)
+ 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2)
 + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e
^2]))/e^3
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3207 vs. $2(563) = 1126$.

Time = 5.45 (sec) , antiderivative size = 3208, normalized size of antiderivative = 5.41

method	result	size
parts	Expression too large to display	3208
derivativedivides	Expression too large to display	3219
default	Expression too large to display	3219

```
[In] int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/e^3*h/(e*x+d)^3-1/4*(-2*d*h+e*g)/e^3/(e*x+d)^4-1/5*(d^2*h-d*e*g+e^2
*f)/e^3/(e*x+d)^5)+b/c*(-1/3*c^4*arcsin(c*x)/e^3*h/(c*e*x+c*d)^3+1/2*c^5*ar
csin(c*x)/e^3/(c*e*x+c*d)^4*d*h-1/4*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^4*g-1/5
*c^6*arcsin(c*x)/e^3/(c*e*x+c*d)^5*d^2*h+1/5*c^6*arcsin(c*x)/e^2/(c*e*x+c*d
)^5*d*g-1/5*c^6*arcsin(c*x)/e/(c*e*x+c*d)^5*f+1/60*c^4/e^3*(20*h/e^3*(1/2/(
c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2
-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(
-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e
)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2
-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^
(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(
1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c
/e)))-15*c*(2*d*h-e*g)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c/
```

e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(
1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^
2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c
/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2
*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+
d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^
2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/
e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e
^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e)))-2/3/(c^2*d^2-e^2)*e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*
c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(
c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c
^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^
2)^(1/2))/(c*x+d*c/e))))+12*c^2*(d^2*h-d*e*g+e^2*f)/e^5*(1/4/(c^2*d^2-e^2)*
e^2/(c*x+d*c/e)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1
/2)+7/4*d*c*e/(c^2*d^2-e^2)*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c
/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*
(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c
^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*
c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^
2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x
+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c
^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)
/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/
e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c
*x+d*c/e)))-2/3/(c^2*d^2-e^2)*e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d
*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-
(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(
c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e
^2)^(1/2))/(c*x+d*c/e))))-3/4/(c^2*d^2-e^2)*e^2*(1/2/(c^2*d^2-e^2)*e^2/(c*x
+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*
d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/
e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/
e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e
^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2
-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+
2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))))))

Fricas [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Timed out}$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
[Out] Timed out
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2)}{(d+ex)^6}\,dx$$

```
[In] integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**6, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
[Out] -1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*
x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/30*(10*e^2*x^2 + 5*d*e*x + d^2)*a*h/(e^8*x
^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d^4*e^4*x + d^5*e^3)
 - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^4*x^3 + 10*d^3*e^3*x^2 + 5*d^4
*e^2*x + d^5*e) - 1/60*((20*b*e^2*h*x^2 + 12*b*e^2*f + 3*b*d*e*g + 2*b*d^2*
h + 5*(3*b*e^2*g + 2*b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + 60*(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d^4*e^4*
x + d^5*e^3)*integrate(1/60*(20*b*c*e^2*h*x^2 + 12*b*c*e^2*f + 3*b*c*d*e*g
+ 2*b*c*d^2*h + 5*(3*b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1/2*
log(-c*x + 1))/(c^4*e^8*x^9 + 5*c^4*d*e^7*x^8 - 5*c^2*d^4*e^4*x^3 - c^2*d^5
*e^3*x^2 + (10*c^4*d^2*e^6 - c^2*e^8)*x^7 + 5*(2*c^4*d^3*e^5 - c^2*d*e^7)*x
^6 + 5*(c^4*d^4*e^4 - 2*c^2*d^2*e^6)*x^5 + (c^4*d^5*e^3 - 10*c^2*d^3*e^5)*x
^4 + (c^2*e^8*x^7 + 5*c^2*d*e^7*x^6 - 5*d^4*e^4*x - d^5*e^3 + (10*c^2*d^2*e
^6 - e^8)*x^5 + 5*(2*c^2*d^3*e^5 - d*e^7)*x^4 + 5*(c^2*d^4*e^4 - 2*d^2*e^6)
*x^3 + (c^2*d^5*e^3 - 10*d^3*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x
))/(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d^4*e^4*x +
 d^5*e^3)
```

Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

```
[In] integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
[Out] integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^6}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6,x)
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6, x)
```

3.106 $\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 684

$$\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))\,x^2\sqrt{1-c^2x^2}}{11025c^5} \\
&+ \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&+ \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))\,x^4\sqrt{1-c^2x^2}}{1225c^3} \\
&+ \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} \\
&+ \frac{b(32(11025c^6d^3f+2450c^4d(3e^2f+3deg+d^2h)+720e^3i+1176c^2e(e^2g+3deh+3d^2i))+3675c^2(24c^4}{352800c^7} \\
&- \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6} \\
&+ d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&+ \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) \\
&+ \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) \\
&+ \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx))
\end{aligned}$$

```
[Out] -1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3*
d*e^2*g+e^3*f))*arcsin(c*x)/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*
f)*x^2*(a+b*arcsin(c*x))+1/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arcsin(c*x)
```

```
)+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4*(a+b*arcsin(c*x))+1/5*e*(3*d^2*
i+3*d*e*h+e^2*g)*x^5*(a+b*arcsin(c*x))+1/6*e^2*(3*d*i+e*h)*x^6*(a+b*arcsin(
c*x))+1/7*e^3*i*x^7*(a+b*arcsin(c*x))+1/11025*b*(1225*c^4*d*(d^2*h+3*d*e*g+
3*e^2*f)+360*e^3*i+588*c^2*e*(3*d^2*i+3*d*e*h+e^2*g))*x^2*(-c^2*x^2+1)^(1/2
)/c^5+1/144*b*(5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f))*x
^3*(-c^2*x^2+1)^(1/2)/c^3+1/1225*b*e*(30*e^2*i+49*c^2*(3*d^2*i+3*d*e*h+e^2*
g))*x^4*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^2*(3*d*i+e*h)*x^5*(-c^2*x^2+1)^(1/2
)/c+1/49*b*e^3*i*x^6*(-c^2*x^2+1)^(1/2)/c+1/352800*b*(352800*c^6*d^3*f+7840
0*c^4*d*(d^2*h+3*d*e*g+3*e^2*f)+23040*e^3*i+37632*c^2*e*(3*d^2*i+3*d*e*h+e^
2*g)+3675*c^2*(24*c^4*d^2*(d*g+3*e*f)+5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*
e*h+3*d*e^2*g+e^3*f))*x)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A] (verified)

Time = 2.43 (sec) , antiderivative size = 684, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = d^3fx(a+b\arcsin(cx)) + \frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right) + \frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right) + \frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx)) - \frac{b\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2(d^3i+3d^2eh+3de^2g+e^3f)+5e^2(3di+eh)\right)}{96c^6} + \frac{be^2x^5\sqrt{1-c^2x^2}(3di+eh)}{36c}+\frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + \frac{bex^4\sqrt{1-c^2x^2}(49c^2(3d^2i+3deh+e^2g)+30e^2i)}{1225c^3} + \frac{bx^3\sqrt{1-c^2x^2}(9c^2(d^3i+3d^2eh+3de^2g+e^3f)+5e^2(3di+eh))}{144c^3} + \frac{bx^2\sqrt{1-c^2x^2}(1225c^4d(d^2h+3deg+3e^2f)+588c^2e(3d^2i+3deh+e^2g)+360e^3i)}{11025c^5} + \frac{b\sqrt{1-c^2x^2}(3675c^2x(24c^4d^2(dg+3ef)+9c^2(d^3i+3d^2eh+3de^2g+e^3f)+5e^2(3di+eh))+32(11025}{352800c^7}$$

```
[In] Int[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(1225*c^4*d*(3*e^2*f + 3*d*e*g + d^2*h) + 360*e^3*i + 588*c^2*e*(e^2*g +
 3*d*e*h + 3*d^2*i))*x^2*Sqrt[1 - c^2*x^2])/(11025*c^5) + (b*(5*e^2*(e*h +
3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*x^3*Sqrt[1 - c^2*x^
2])/(144*c^3) + (b*e*(30*e^2*i + 49*c^2*(e^2*g + 3*d*e*h + 3*d^2*i))*x^4*Sq
```

rt[1 - c^2*x^2])/(1225*c^3) + (b*e^2*(e*h + 3*d*i)*x^5*Sqrt[1 - c^2*x^2])/(36*c) + (b*e^3*i*x^6*Sqrt[1 - c^2*x^2])/(49*c) + (b*(32*(11025*c^6*d^3*f + 2450*c^4*d*(3*e^2*f + 3*d*e*g + d^2*h) + 720*e^3*i + 1176*c^2*e*(e^2*g + 3*d*e*h + 3*d^2*i)) + 3675*c^2*(24*c^4*d^2*(3*e*f + d*g) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*x)*Sqrt[1 - c^2*x^2])/(352800*c^7) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*ArcSin[c*x])/(96*c^6) + d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + (d*(3*e^2*f + 3*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e^2*g + 3*d*e*h + 3*d^2*i)*x^5*(a + b*ArcSin[c*x]))/5 + (e^2*(e*h + 3*d*i)*x^6*(a + b*ArcSin[c*x]))/6 + (e^3*i*x^7*(a + b*ArcSin[c*x]))/7

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p + 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p + 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m + q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHide[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
```

```
] && PolynomialQ[Px, x]
```

Rubi steps

$$\text{integral} = d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) - (bc)\int \frac{x(35d^3(12f+x(6g+x(4h+3ix)))+21d^2ex(30f+x(20g+3x(5h+4ix)))+21de^2x^2(20f+}{420\sqrt{1-c^2x^2}}$$

$$= d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) - \frac{1}{420}(bc)\int \frac{x(35d^3(12f+x(6g+x(4h+3ix)))+21d^2ex(30f+x(20g+3x(5h+4ix)))+21de}{\sqrt{1-c^2}}$$

$$= \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) + \frac{b\int \frac{x\left(-2940c^2d^3f-1470c^2d^2(3ef+dg)x-980c^2d\left(3e^2f+3deg+d^2h\right)x^2-735c^2\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^3-12e\left(30e^2i+49c^2\left(e^2g\right.\right.\right.}{\sqrt{1-c^2x^2}}}{2940c}$$

$$= \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) - \frac{b\int \frac{x(17640c^4d^3f+8820c^4d^2(3ef+dg)x+5880c^4d(3e^2f+3deg+d^2h)x^2+490c^2(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))x^3+72}{\sqrt{1-c^2x^2}}}{17640c^3}$$

$$= \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))x^4\sqrt{1-c^2x^2}}{1225c^3} + \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) + \frac{b\int \frac{x(-88200c^6d^3f-44100c^6d^2(3ef+dg)x-24c^2(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))x^2-2450c^4(5e^2(e}{\sqrt{1-c^2x^2}}}{88200c^5}$$

$$= \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))x^4\sqrt{1-c^2x^2}}{1225c^3} + \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) - \frac{b\int \frac{x(352800c^8d^3f+7350c^4(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))x+96c^4(1225c^4d(3e^2f+3deg+d^2h)+3}{\sqrt{1-c^2x^2}}}{352800c^7}$$

$$
\begin{aligned}
&= \frac{b(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))\,x^2\sqrt{1-c^2x^2}}{11025c^5} \\
&+ \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&+ \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))\,x^4\sqrt{1-c^2x^2}}{1225c^3} \\
&+ \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} + d^3fx(a+b\arcsin(cx)) \\
&+ \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&+ \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) \\
&+ \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) \\
&+ \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) \\
&+ \frac{b\int \frac{x\left(-96c^4\left(11025c^6d^3f+2450c^4d\left(3e^2f+3deg+d^2h\right)+720e^3i+1176c^2e\left(e^2g+3deh+3d^2i\right)\right)-22050c^6\left(24c^4d^2(3ef+dg)+5e^2(eh+\right.\right.}{\sqrt{1-c^2x^2}}}{1058400c^9}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))\,x^2\sqrt{1-c^2x^2}}{11025c^5} \\
&+ \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&+ \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))\,x^4\sqrt{1-c^2x^2}}{1225c^3} \\
&+ \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} \\
&+ \frac{b(32(11025c^6d^3f+2450c^4d(3e^2f+3deg+d^2h)+720e^3i+1176c^2e(e^2g+3deh+3d^2i))+367}{352800c} \\
&+ d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&+ \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) \\
&+ \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) \\
&+ \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx)) \\
&- \frac{(b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i)))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5}
\end{aligned}
$$

$$= \frac{b(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))\,x^2\sqrt{1-c^2x^2}}{11025c^5}$$
$$+ \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3}$$
$$+ \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))\,x^4\sqrt{1-c^2x^2}}{1225c^3}$$
$$+ \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c}$$
$$+ \frac{b(32(11025c^6d^3f+2450c^4d(3e^2f+3deg+d^2h)+720e^3i+1176c^2e(e^2g+3deh+3d^2i))+3675}{352800c^7}$$
$$- \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6}$$
$$+ d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))$$
$$+ \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx))$$
$$+ \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 619, normalized size of antiderivative = 0.90

$$\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= ad^3fx + \frac{1}{2}ad^2(3ef+dg)x^2 + \frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3 + \frac{1}{4}a\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4$$
$$+ \frac{1}{5}ae\left(e^2g+3deh+3d^2i\right)x^5 + \frac{1}{6}ae^2(eh+3di)x^6 + \frac{1}{7}ae^3ix^7$$
$$+ \frac{b\sqrt{1-c^2x^2}(23040e^3i+3c^2e(37632d^2i+147de(256h+125ix)+e^2(12544g+5x(1225h+768ix)))+c^4(}{}$$
$$- \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6}$$
$$+ \frac{1}{420}bx\left(35d^3(12f+x(6g+x(4h+3ix)))+21d^2ex(30f+x(20g+3x(5h+4ix)))\right.$$
$$\left.+21de^2x^2(20f+x(15g+2x(6h+5ix)))+e^3x^3(105f+2x(42g+5x(7h+6ix)))\right)\arcsin(cx)$$

```
[In] Integrate[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

```
[Out] a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)*
x^3)/3 + (a*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4)/4 + (a*e*(e^2*g +
3*d*e*h + 3*d^2*i)*x^5)/5 + (a*e^2*(e*h + 3*d*i)*x^6)/6 + (a*e^3*i*x^7)/7 +
```

```
(b*Sqrt[1 - c^2*x^2]*(23040*e^3*i + 3*c^2*e*(37632*d^2*i + 147*d*e*(256*h
+ 125*i*x) + e^2*(12544*g + 5*x*(1225*h + 768*i*x))) + c^4*(1225*d^3*(64*h
+ 27*i*x) + 147*d^2*e*(1600*g + 675*h*x + 384*i*x^2) + 147*d*e^2*(1600*f +
x*(675*g + 384*h*x + 250*i*x^2)) + e^3*x*(33075*f + 2*x*(9408*g + 6125*h*x
+ 4320*i*x^2))) + 2*c^6*(1225*d^3*(144*f + x*(36*g + x*(16*h + 9*i*x))) + 1
47*d^2*e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))) + 147*d*e^2*x^2*(400*f
 + x*(225*g + 4*x*(36*h + 25*i*x))) + e^3*x^3*(11025*f + 4*x*(1764*g + 25*x
*(49*h + 36*i*x))))))/(352800*c^7) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^2*(
e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*ArcSin[c*x])/
(96*c^6) + (b*x*(35*d^3*(12*f + x*(6*g + x*(4*h + 3*i*x))) + 21*d^2*e*x*(30
*f + x*(20*g + 3*x*(5*h + 4*i*x))) + 21*d*e^2*x^2*(20*f + x*(15*g + 2*x*(6*
h + 5*i*x))) + e^3*x^3*(105*f + 2*x*(42*g + 5*x*(7*h + 6*i*x))))*ArcSin[c*x
])/420
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 836, normalized size of antiderivative = 1.22

method	result
parts	$a\left(\frac{e^3 i x^7}{7}+\frac{(3d e^2 i+e^3 h)x^6}{6}+\frac{(3d^2 ei+3d e^2 h+e^3 g)x^5}{5}+\frac{(d^3 i+3d^2 eh+3d e^2 g+e^3 f)x^4}{4}+\frac{(d^3 h+3d^2 eg+3d e^2 f)}{3}\right.$
derivativedivides	$\frac{a\left(\frac{e^3 i c^7 x^7}{7}+\frac{(3dc e^2 i+e^3 ch)c^6 x^6}{6}+\frac{(3c^2 d^2 ei+3d c^2 e^2 h+e^3 c^2 g)c^5 x^5}{5}+\frac{(c^3 d^3 i+3c^3 d^2 eh+3d c^3 e^2 g+e^3 f c^3)c^4 x^4}{4}+\frac{(c^4 d^3 h+3c^4 d^2}{}\right.}{c^6}$
default	$\frac{a\left(\frac{e^3 i c^7 x^7}{7}+\frac{(3dc e^2 i+e^3 ch)c^6 x^6}{6}+\frac{(3c^2 d^2 ei+3d c^2 e^2 h+e^3 c^2 g)c^5 x^5}{5}+\frac{(c^3 d^3 i+3c^3 d^2 eh+3d c^3 e^2 g+e^3 f c^3)c^4 x^4}{4}+\frac{(c^4 d^3 h+3c^4 d^2}{}\right.}{c^6}$

```
[In] int((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

```
[Out] a*(1/7*e^3*i*x^7+1/6*(3*d*e^2*i+e^3*h)*x^6+1/5*(3*d^2*e*i+3*d*e^2*h+e^3*g)*
x^5+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^2*
f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/7*c*arcsin(c*x)*e^3*i*x^7+
1/2*c*arcsin(c*x)*x^6*d*e^2*i+1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(c*x)
*x^5*d^2*e*i+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arcsin(c*x)*e^3*g*x^5+1/4*
c*arcsin(c*x)*x^4*d^3*i+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*x)*x^4
*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*arcsin(c
*x)*x^3*d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c
*arcsin(c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/420/c^6*(60*e^3*i*(-1/7*c^
6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2
*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-420*d^3*c^6*f*(-c^2*x^2+1)^(1/2)+(2
10*c*d*e^2*i+70*c*e^3*h)*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^
```

```
2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+(210*c^5*d^3*g
+630*c^5*d^2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+(252*c^2*d^
2*e*i+252*c^2*d*e^2*h+84*c^2*e^3*g)*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c
^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+(140*c^4*d^3*h+420*c^4*d
^2*e*g+420*c^4*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(
1/2))+(105*c^3*d^3*i+315*c^3*d^2*e*h+315*c^3*d*e^2*g+105*c^3*e^3*f)*(-1/4*c
^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 936, normalized size of antiderivative = 1.37

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{50400\,ac^7e^3ix^7 + 352800\,ac^7d^3fx + 58800\,(ac^7e^3h + 3\,ac^7de^2i)x^6 + 70560\,(ac^7e^3g + 3\,ac^7de^2h + 3\,ac^7d^2ei)}{}$$

```
[In] integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

```
[Out] 1/352800*(50400*a*c^7*e^3*i*x^7 + 352800*a*c^7*d^3*f*x + 58800*(a*c^7*e^3*h
 + 3*a*c^7*d*e^2*i)*x^6 + 70560*(a*c^7*e^3*g + 3*a*c^7*d*e^2*h + 3*a*c^7*d^
2*e*i)*x^5 + 88200*(a*c^7*e^3*f + 3*a*c^7*d*e^2*g + 3*a*c^7*d^2*e*h + a*c^7
*d^3*i)*x^4 + 117600*(3*a*c^7*d*e^2*f + 3*a*c^7*d^2*e*g + a*c^7*d^3*h)*x^3
+ 176400*(3*a*c^7*d^2*e*f + a*c^7*d^3*g)*x^2 + 105*(480*b*c^7*e^3*i*x^7 + 3
360*b*c^7*d^3*f*x + 560*(b*c^7*e^3*h + 3*b*c^7*d*e^2*i)*x^6 + 672*(b*c^7*e^
3*g + 3*b*c^7*d*e^2*h + 3*b*c^7*d^2*e*i)*x^5 + 840*(b*c^7*e^3*f + 3*b*c^7*d
*e^2*g + 3*b*c^7*d^2*e*h + b*c^7*d^3*i)*x^4 + 1120*(3*b*c^7*d*e^2*f + 3*b*c
^7*d^2*e*g + b*c^7*d^3*h)*x^3 + 1680*(3*b*c^7*d^2*e*f + b*c^7*d^3*g)*x^2 -
315*(8*b*c^5*d^2*e + b*c^3*e^3)*f - 105*(8*b*c^5*d^3 + 9*b*c^3*d*e^2)*g - 3
5*(27*b*c^3*d^2*e + 5*b*c*e^3)*h - 105*(3*b*c^3*d^3 + 5*b*c*d*e^2)*i)*arcsi
n(c*x) + (7200*b*c^6*e^3*i*x^6 + 9800*(b*c^6*e^3*h + 3*b*c^6*d*e^2*i)*x^5 +
 288*(49*b*c^6*e^3*g + 147*b*c^6*d*e^2*h + 3*(49*b*c^6*d^2*e + 10*b*c^4*e^3
)*i)*x^4 + 2450*(9*b*c^6*e^3*f + 27*b*c^6*d*e^2*g + (27*b*c^6*d^2*e + 5*b*c
^4*e^3)*h + 3*(3*b*c^6*d^3 + 5*b*c^4*d*e^2)*i)*x^3 + 32*(3675*b*c^6*d*e^2*f
 + 147*(25*b*c^6*d^2*e + 4*b*c^4*e^3)*g + 49*(25*b*c^6*d^3 + 36*b*c^4*d*e^2
)*h + 36*(49*b*c^4*d^2*e + 10*b*c^2*e^3)*i)*x^2 + 117600*(3*b*c^6*d^3 + 2*b
*c^4*d*e^2)*f + 9408*(25*b*c^4*d^2*e + 4*b*c^2*e^3)*g + 3136*(25*b*c^4*d^3
+ 36*b*c^2*d*e^2)*h + 2304*(49*b*c^2*d^2*e + 10*b*e^3)*i + 3675*(9*(8*b*c^6
*d^2*e + b*c^4*e^3)*f + 3*(8*b*c^6*d^3 + 9*b*c^4*d*e^2)*g + (27*b*c^4*d^2*e
 + 5*b*c^2*e^3)*h + 3*(3*b*c^4*d^3 + 5*b*c^2*d*e^2)*i)*x)*sqrt(-c^2*x^2 + 1
))/c^7
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1809 vs. 2(688) = 1376.

Time = 0.93 (sec) , antiderivative size = 1809, normalized size of antiderivative = 2.64

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)**3*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + a*d**3*i*x**4/4
 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + 3*a*d**2*e
*i*x**5/5 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + 3*a*d*e**2*h*x**5/5 + a
*d*e**2*i*x**6/2 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*e**3*h*x**6/6 + a*
e**3*i*x**7/7 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d**3*h
*x**3*asin(c*x)/3 + b*d**3*i*x**4*asin(c*x)/4 + 3*b*d**2*e*f*x**2*asin(c*x)
/2 + b*d**2*e*g*x**3*asin(c*x) + 3*b*d**2*e*h*x**4*asin(c*x)/4 + 3*b*d**2*e
*i*x**5*asin(c*x)/5 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e**2*g*x**4*asin(c*
x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*d*e**2*i*x**6*asin(c*x)/2 + b*e**3
*f*x**4*asin(c*x)/4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*asin(c*x)/6
 + b*e**3*i*x**7*asin(c*x)/7 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x
*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*
d**3*i*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 +
1)/(4*c) + b*d**2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d**2*e*h*x**3*s
qrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*i*x**4*sqrt(-c**2*x**2 + 1)/(25*c)
+ b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*g*x**3*sqrt(-c**2
*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*d*e**
2*i*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + b*e**3*f*x**3*sqrt(-c**2*x**2 + 1)/(
16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**3*h*x**5*sqrt(-c**
2*x**2 + 1)/(36*c) + b*e**3*i*x**6*sqrt(-c**2*x**2 + 1)/(49*c) - b*d**3*g*a
sin(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**3*h*sqrt(-c**2
*x**2 + 1)/(9*c**3) + 3*b*d**3*i*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 2*b*d**
2*e*g*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d**2*e*h*x*sqrt(-c**2*x**2 + 1)/(
32*c**3) + 4*b*d**2*e*i*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 2*b*d*e**2*f*
sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**
3) + 4*b*d*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 5*b*d*e**2*i*x**3*s
qrt(-c**2*x**2 + 1)/(48*c**3) + 3*b*e**3*f*x*sqrt(-c**2*x**2 + 1)/(32*c**3)
 + 4*b*e**3*g*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 5*b*e**3*h*x**3*sqrt(-c
**2*x**2 + 1)/(144*c**3) + 6*b*e**3*i*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3)
- 3*b*d**3*i*asin(c*x)/(32*c**4) - 9*b*d**2*e*h*asin(c*x)/(32*c**4) - 9*b*d
*e**2*g*asin(c*x)/(32*c**4) - 3*b*e**3*f*asin(c*x)/(32*c**4) + 8*b*d**2*e*i
*sqrt(-c**2*x**2 + 1)/(25*c**5) + 8*b*d*e**2*h*sqrt(-c**2*x**2 + 1)/(25*c**
5) + 5*b*d*e**2*i*x*sqrt(-c**2*x**2 + 1)/(32*c**5) + 8*b*e**3*g*sqrt(-c**2*
x**2 + 1)/(75*c**5) + 5*b*e**3*h*x*sqrt(-c**2*x**2 + 1)/(96*c**5) + 8*b*e**
3*i*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) - 5*b*d*e**2*i*asin(c*x)/(32*c**6)
```

```
 - 5*b*e**3*h*asin(c*x)/(96*c**6) + 16*b*e**3*i*sqrt(-c**2*x**2 + 1)/(245*c
**7), Ne(c, 0)), (a*(d**3*f*x + d**3*g*x**2/2 + d**3*h*x**3/3 + d**3*i*x**4
/4 + 3*d**2*e*f*x**2/2 + d**2*e*g*x**3 + 3*d**2*e*h*x**4/4 + 3*d**2*e*i*x**
5/5 + d*e**2*f*x**3 + 3*d*e**2*g*x**4/4 + 3*d*e**2*h*x**5/5 + d*e**2*i*x**6
/2 + e**3*f*x**4/4 + e**3*g*x**5/5 + e**3*h*x**6/6 + e**3*i*x**7/7), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 1231, normalized size of antiderivative = 1.80

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

```
[Out] 1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 + 3
/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4
+ 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/3
*a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^3*a
rcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d
*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-
c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*x^3*arc
sin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2
*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^
2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5*arcsin(c*
x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(
-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x^4*arcsin(c*x)
+ (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x
)/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/
c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e^2*h
 + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2
*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*
e^3*h + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c
^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^3*i + 1/25*(15*x^5*arcsin(c*x
) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-
c^2*x^2 + 1)/c^6)*c)*b*d^2*e*i + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^
2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^
6 - 15*arcsin(c*x)/c^7)*c)*b*d*e^2*i + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(
-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)
*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^3*i + a*d^3*f*x + (c*x*arcsin(
c*x) + sqrt(-c^2*x^2 + 1))*b*d^3*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2010 vs. $2(643) = 1286$.

Time = 0.33 (sec) , antiderivative size = 2010, normalized size of antiderivative = 2.94

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gia
c")

[Out] 1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 + 3
/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4
+ 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/3
*a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*f*
x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x^
2 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x/c + 1
/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcsin(c*x)
/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcsin(c*x)/
c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*arcsin(c*
x)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*e^2*h*x*ar
csin(c*x)/c^4 + 3/5*(c^2*x^2 - 1)^2*b*d^2*e*i*x*arcsin(c*x)/c^4 + sqrt(-c^2
*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*
x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*h*x/c^3
- 1/16*(-c^2*x^2 + 1)^(3/2)*b*d^3*i*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2
 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2
*x^2 - 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^
2*x^2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*h*arcs
in(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b*d^3*i*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 -
1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d*e^2*h*x*arcsin(c*x)/c^
4 + 6/5*(c^2*x^2 - 1)*b*d^2*e*i*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*e
^3*i*x*arcsin(c*x)/c^6 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*f/c^3 - 1/3*(-c^2
*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^3*h/c^3 + 5/32
*sqrt(-c^2*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*g*x/c^
3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d^2*e*h*x/c^3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c
^2*x^2 + 1)*b*e^3*h*x/c^5 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^3*i*x/c^3 + 1/12*(c
^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2*i*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^3*
f*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b*d*e^2*g*arcsin(c*x)/c^4 + 3/2*(c^2*
x^2 - 1)*b*d^2*e*h*arcsin(c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b*e^3*h*arcsin(c*x
)/c^6 + 1/2*(c^2*x^2 - 1)*b*d^3*i*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^3*b*d
*e^2*i*arcsin(c*x)/c^6 + 1/5*b*e^3*g*x*arcsin(c*x)/c^4 + 3/5*b*d*e^2*h*x*ar
csin(c*x)/c^4 + 3/5*b*d^2*e*i*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e^3
*i*x*arcsin(c*x)/c^6 + sqrt(-c^2*x^2 + 1)*b*d*e^2*f/c^3 + sqrt(-c^2*x^2 + 1
)*b*d^2*e*g/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3*g/c^5 + 1/3
*sqrt(-c^2*x^2 + 1)*b*d^3*h/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
```

```
*d*e^2*h/c^5 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*e*i/c^5 - 13/1
44*(-c^2*x^2 + 1)^(3/2)*b*e^3*h*x/c^5 - 13/48*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*
i*x/c^5 + 5/32*b*e^3*f*arcsin(c*x)/c^4 + 15/32*b*d*e^2*g*arcsin(c*x)/c^4 +
15/32*b*d^2*e*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e^3*h*arcsin(c*x)/c
^6 + 5/32*b*d^3*i*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)^2*b*d*e^2*i*arcsin(c*
x)/c^6 + 3/7*(c^2*x^2 - 1)*b*e^3*i*x*arcsin(c*x)/c^6 - 2/15*(-c^2*x^2 + 1)^
(3/2)*b*e^3*g/c^5 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*h/c^5 - 2/5*(-c^2*x^2
+ 1)^(3/2)*b*d^2*e*i/c^5 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3*i/
c^7 + 11/96*sqrt(-c^2*x^2 + 1)*b*e^3*h*x/c^5 + 11/32*sqrt(-c^2*x^2 + 1)*b*d
*e^2*i*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^3*h*arcsin(c*x)/c^6 + 3/2*(c^2*x^2 - 1
)*b*d*e^2*i*arcsin(c*x)/c^6 + 1/7*b*e^3*i*x*arcsin(c*x)/c^6 + 1/5*sqrt(-c^2
*x^2 + 1)*b*e^3*g/c^5 + 3/5*sqrt(-c^2*x^2 + 1)*b*d*e^2*h/c^5 + 3/5*sqrt(-c^
2*x^2 + 1)*b*d^2*e*i/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3*i/
c^7 + 11/96*b*e^3*h*arcsin(c*x)/c^6 + 11/32*b*d*e^2*i*arcsin(c*x)/c^6 - 1/7
*(-c^2*x^2 + 1)^(3/2)*b*e^3*i/c^7 + 1/7*sqrt(-c^2*x^2 + 1)*b*e^3*i/c^7
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$= \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^3\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3),x)
[Out] int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3), x)
```

3.107 $\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 484

$$
\begin{aligned}
&\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))\,x^2\sqrt{1-c^2x^2}}{225c^3} \\
&\quad + \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&\quad + \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} \\
&\quad + \frac{b(32(225c^4d^2f+50c^2(e^2f+2deg+d^2h)+24e(eh+2di))+75(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2d}{7200c^5} \\
&\quad - \frac{b(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i))\arcsin(cx)}{96c^6} \\
&\quad + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx)) \\
&\quad + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx))
\end{aligned}
$$

```
[Out] -1/96*b*(24*c^4*d*(d*g+2*e*f)+5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e^2*g))*arcsin(c
*x)/c^6+d^2*f*x*(a+b*arcsin(c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1
/3*(d^2*h+2*d*e*g+e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*(d^2*i+2*d*e*h+e^2*g)*x^
4*(a+b*arcsin(c*x))+1/5*e*(2*d*i+e*h)*x^5*(a+b*arcsin(c*x))+1/6*e^2*i*x^6*(
a+b*arcsin(c*x))+1/225*b*(25*c^2*(d^2*h+2*d*e*g+e^2*f)+12*e*(2*d*i+e*h))*x^
2*(-c^2*x^2+1)^(1/2)/c^3+1/144*b*(5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e^2*g))*x^3*
(-c^2*x^2+1)^(1/2)/c^3+1/25*b*e*(2*d*i+e*h)*x^4*(-c^2*x^2+1)^(1/2)/c+1/36*b
*e^2*i*x^5*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*c^4*d^2*f+1600*c^2*(d^2*h+2*
```

```
d*e*g+e^2*f)+768*e*(2*d*i+e*h)+75*(24*c^4*d*(d*g+2*e*f)+5*e^2*i+9*c^2*(d^2*
i+2*d*e*h+e^2*g))*x)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 482, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.161$, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right) + \frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right) + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx)) + \frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) - \frac{b\arcsin(cx)\left(24c^4d(dg+2ef)+9c^2(d^2i+2deh+e^2g)+5e^2i\right)}{96c^6} + \frac{bx^3\sqrt{1-c^2x^2}\left(e^2\left(\frac{5i}{c^2}+9g\right)+9d^2i+18deh\right)}{144c} + \frac{bex^4\sqrt{1-c^2x^2}(2di+eh)}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + \frac{bx^2\sqrt{1-c^2x^2}(25c^2(d^2h+2deg+e^2f)+12e(2di+eh))}{225c^3} + \frac{b\sqrt{1-c^2x^2}(75x(24c^4d(dg+2ef)+9c^2(d^2i+2deh+e^2g)+5e^2i)+32(225c^4d^2f+50c^2(d^2h+2deg+e}{7200c^5}$$

```
[In] Int[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(25*c^2*(e^2*f + 2*d*e*g + d^2*h) + 12*e*(e*h + 2*d*i))*x^2*Sqrt[1 - c^2
*x^2])/(225*c^3) + (b*(18*d*e*h + 9*d^2*i + e^2*(9*g + (5*i)/c^2))*x^3*Sqrt
[1 - c^2*x^2])/(144*c) + (b*e*(e*h + 2*d*i)*x^4*Sqrt[1 - c^2*x^2])/(25*c) +
 (b*e^2*i*x^5*Sqrt[1 - c^2*x^2])/(36*c) + (b*(32*(225*c^4*d^2*f + 50*c^2*(e
^2*f + 2*d*e*g + d^2*h) + 24*e*(e*h + 2*d*i)) + 75*(24*c^4*d*(2*e*f + d*g)
+ 5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h + d^2*i))*x)*Sqrt[1 - c^2*x^2])/(7200*c^
5) - (b*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h + d^2*i)
)*ArcSin[c*x])/(96*c^6) + d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^
2*(a + b*ArcSin[c*x]))/2 + ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x
]))/3 + ((e^2*g + 2*d*e*h + d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2
*d*i)*x^5*(a + b*ArcSin[c*x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))+\frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x(5d^2(12f+x(6g+x(4h+3ix)))+2dex(30f+x(20g+3x(5h+4ix)))+e^2x^2(20f+x(15g-}{60\sqrt{1-c^2x^2}} \\
&= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))+\frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx)) \\
&\quad-\frac{1}{60}(bc)\int\frac{x(5d^2(12f+x(6g+x(4h+3ix)))+2dex(30f+x(20g+3x(5h+4ix)))+e^2x^2(20f}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(e^2f+2deg+d^2h)x^3(a+b\arcsin(cx)) + \frac{1}{4}(e^2g+2deh+d^2i)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) + \frac{b\int \frac{x(-360c^2d^2f-180c^2d(2ef+dg)x-120c^2(e^2f+2deg+d^2h)x^2-10(5e^2i+9c^2(e^2g+2deh+d^2i))x^3-72c^2e(eh+2di)x^4)}{\sqrt{1-c^2x^2}}dx}{360c}$$

$$= \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(e^2f+2deg+d^2h)x^3(a+b\arcsin(cx)) + \frac{1}{4}(e^2g+2deh+d^2i)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) - \frac{b\int \frac{x(1800c^4d^2f+900c^4d(2ef+dg)x+24c^2(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))x^2+50c^2(5e^2i+9c^2(e^2g+2deh+d^2i))x^3)}{\sqrt{1-c^2x^2}}dx}{1800c^3}$$

$$= \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(e^2f+2deg+d^2h)x^3(a+b\arcsin(cx)) + \frac{1}{4}(e^2g+2deh+d^2i)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) + \frac{b\int \frac{x(-7200c^6d^2f-150c^2(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i))x-96c^4(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))x^2)}{\sqrt{1-c^2x^2}}dx}{7200c^5}$$

$$= \frac{b(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(e^2f+2deg+d^2h)x^3(a+b\arcsin(cx)) + \frac{1}{4}(e^2g+2deh+d^2i)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) - \frac{b\int \frac{x(96c^4(225c^4d^2f+50c^2(e^2f+2deg+d^2h)+24e(eh+2di))+450c^4(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i))x)}{\sqrt{1-c^2x^2}}dx}{21600c^7}$$

$$= \frac{b(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))\,x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + \frac{b(32(225c^4d^2f+50c^2(e^2f+2deg+d^2h)+24e(eh+2di))+75(24c^4d(2ef+dg)+5e^2i+9c^2(}{7200c^5} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx)) - \frac{(b(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i)))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5}$$

$$= \frac{b(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))\,x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} + \frac{b(32(225c^4d^2f+50c^2(e^2f+2deg+d^2h)+24e(eh+2di))+75(24c^4d(2ef+dg)+5e^2i+9c^2(}{7200c^5} - \frac{b(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i))\arcsin(cx)}{96c^6} + d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx)) + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.91 (sec) , antiderivative size = 380, normalized size of antiderivative = 0.79

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$= d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$
$$+ \frac{b\left(c\sqrt{1-c^2x^2}\left(3e(256eh+512di+125eix)+c^2\left(25d^2(64h+27ix)+2de\left(1600g+675hx+384ix^2\right)+e^2\right.\right.\right.}{}$$

```
[In] Integrate[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

```
[Out] d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 +
 ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^2*g + 2*d*e*h
+ d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2*d*i)*x^5*(a + b*ArcSin[c*
x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6 + (b*(c*Sqrt[1 - c^2*x^2]*(3*e*(
256*e*h + 512*d*i + 125*e*i*x) + c^2*(25*d^2*(64*h + 27*i*x) + 2*d*e*(1600*
g + 675*h*x + 384*i*x^2) + e^2*(1600*f + x*(675*g + 384*h*x + 250*i*x^2)))
+ 2*c^4*(25*d^2*(144*f + x*(36*g + x*(16*h + 9*i*x))) + 2*d*e*x*(900*f + x*
(400*g + 9*x*(25*h + 16*i*x))) + e^2*x^2*(400*f + x*(225*g + 4*x*(36*h + 25
*i*x))))) - 75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h +
 d^2*i))*ArcSin[c*x]))/(7200*c^6)
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 602, normalized size of antiderivative = 1.24

method	result
parts	$a\left(\frac{e^2 i\,x^6}{6}+\frac{(2dei+e^2h)x^5}{5}+\frac{(d^2i+2deh+e^2g)x^4}{4}+\frac{(d^2h+2deg+e^2f)x^3}{3}+\frac{(d^2g+2def)x^2}{2}+d^2fx\right)+\frac{b\left(\frac{c\,a}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{e^2 i\,c^6x^6}{6}+\frac{(2dcei+e^2ch)c^5x^5}{5}+\frac{(c^2d^2i+2d\,c^2eh+e^2c^2g)c^4x^4}{4}+\frac{(c^3d^2h+2d\,c^3eg+e^2f\,c^3)c^3x^3}{3}+\frac{(c^4d^2g+2d\,c^4ef)c^2x^2}{2}+d^2c^6fx\right.}{c^5}$
default	$\frac{a\left(\frac{e^2 i\,c^6x^6}{6}+\frac{(2dcei+e^2ch)c^5x^5}{5}+\frac{(c^2d^2i+2d\,c^2eh+e^2c^2g)c^4x^4}{4}+\frac{(c^3d^2h+2d\,c^3eg+e^2f\,c^3)c^3x^3}{3}+\frac{(c^4d^2g+2d\,c^4ef)c^2x^2}{2}+d^2c^6fx\right.}{c^5}$

```
[In] int((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

```
[Out] a*(1/6*e^2*i*x^6+1/5*(2*d*e*i+e^2*h)*x^5+1/4*(d^2*i+2*d*e*h+e^2*g)*x^4+1/3*
(d^2*h+2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/6*c*arcsi
n(c*x)*e^2*i*x^6+2/5*c*arcsin(c*x)*x^5*d*e*i+1/5*c*arcsin(c*x)*e^2*h*x^5+1/
4*c*arcsin(c*x)*x^4*d^2*i+1/2*c*arcsin(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)*e^2
*g*x^4+1/3*c*arcsin(c*x)*x^3*d^2*h+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin
(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(
c*x)*d^2*f*c*x-1/60/c^5*(10*e^2*i*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3
*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-60*d^
2*c^5*f*(-c^2*x^2+1)^(1/2)+(24*c*d*e*i+12*c*e^2*h)*(-1/5*c^4*x^4*(-c^2*x^2+
1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+(30*c^4*d
^2*g+60*c^4*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+(15*c^2*d^
2*i+30*c^2*d*e*h+15*c^2*e^2*g)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c
^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(20*c^3*d^2*h+40*c^3*d*e*g+20*c^3*e^2*f)*(
-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 621, normalized size of antiderivative = 1.28

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1200\,ac^6e^2ix^6+7200\,ac^6d^2fx+1440\,(ac^6e^2h+2\,ac^6dei)x^5+1800\,(ac^6e^2g+2\,ac^6deh+ac^6d^2i)x^4+240\cdots}{}$$

```
[In] integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

```
[Out] 1/7200*(1200*a*c^6*e^2*i*x^6 + 7200*a*c^6*d^2*f*x + 1440*(a*c^6*e^2*h + 2*a
*c^6*d*e*i)*x^5 + 1800*(a*c^6*e^2*g + 2*a*c^6*d*e*h + a*c^6*d^2*i)*x^4 + 24
00*(a*c^6*e^2*f + 2*a*c^6*d*e*g + a*c^6*d^2*h)*x^3 + 3600*(2*a*c^6*d*e*f +
a*c^6*d^2*g)*x^2 + 15*(80*b*c^6*e^2*i*x^6 + 480*b*c^6*d^2*f*x - 240*b*c^4*d
*e*f - 90*b*c^2*d*e*h + 96*(b*c^6*e^2*h + 2*b*c^6*d*e*i)*x^5 + 120*(b*c^6*e
^2*g + 2*b*c^6*d*e*h + b*c^6*d^2*i)*x^4 + 160*(b*c^6*e^2*f + 2*b*c^6*d*e*g
+ b*c^6*d^2*h)*x^3 + 240*(2*b*c^6*d*e*f + b*c^6*d^2*g)*x^2 - 15*(8*b*c^4*d^
2 + 3*b*c^2*e^2)*g - 5*(9*b*c^2*d^2 + 5*b*e^2)*i)*arcsin(c*x) + (200*b*c^5*
e^2*i*x^5 + 3200*b*c^3*d*e*g + 1536*b*c*d*e*i + 288*(b*c^5*e^2*h + 2*b*c^5*
d*e*i)*x^4 + 50*(9*b*c^5*e^2*g + 18*b*c^5*d*e*h + (9*b*c^5*d^2 + 5*b*c^3*e^
2)*i)*x^3 + 32*(25*b*c^5*e^2*f + 50*b*c^5*d*e*g + 24*b*c^3*d*e*i + (25*b*c^
5*d^2 + 12*b*c^3*e^2)*h)*x^2 + 800*(9*b*c^5*d^2 + 2*b*c^3*e^2)*f + 64*(25*b
*c^3*d^2 + 12*b*c*e^2)*h + 75*(48*b*c^5*d*e*f + 18*b*c^3*d*e*h + 3*(8*b*c^5
*d^2 + 3*b*c^3*e^2)*g + (9*b*c^3*d^2 + 5*b*c*e^2)*i)*x)*sqrt(-c^2*x^2 + 1))
/c^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1197 vs. $2(474) = 948$.

Time = 0.68 (sec) , antiderivative size = 1197, normalized size of antiderivative = 2.47

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)**2*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d**2*i*x**4/4
 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + 2*a*d*e*i*x**5/5 + a*
e**2*f*x**3/3 + a*e**2*g*x**4/4 + a*e**2*h*x**5/5 + a*e**2*i*x**6/6 + b*d**
2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2*h*x**3*asin(c*x)/3 + b
*d**2*i*x**4*asin(c*x)/4 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x
)/3 + b*d*e*h*x**4*asin(c*x)/2 + 2*b*d*e*i*x**5*asin(c*x)/5 + b*e**2*f*x**3
*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*e**2*h*x**5*asin(c*x)/5 + b*e*
*2*i*x**6*asin(c*x)/6 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b*d**2*g*x*sqrt(-
c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d**2*i*
x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e*f*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2
*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*e*h*x**3*sqrt(-c**2*x**2 + 1
)/(8*c) + 2*b*d*e*i*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*f*x**2*sqrt(-
c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**2*h
*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*i*x**5*sqrt(-c**2*x**2 + 1)/(36*
c) - b*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2) + 2*b*d**2*h*
sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d**2*i*x*sqrt(-c**2*x**2 + 1)/(32*c**3)
 + 4*b*d*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*sqrt(-c**2*x**2 +
1)/(16*c**3) + 8*b*d*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 2*b*e**2*f*s
qrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3)
+ 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 5*b*e**2*i*x**3*sqrt(-c*
*2*x**2 + 1)/(144*c**3) - 3*b*d**2*i*asin(c*x)/(32*c**4) - 3*b*d*e*h*asin(c
*x)/(16*c**4) - 3*b*e**2*g*asin(c*x)/(32*c**4) + 16*b*d*e*i*sqrt(-c**2*x**2
 + 1)/(75*c**5) + 8*b*e**2*h*sqrt(-c**2*x**2 + 1)/(75*c**5) + 5*b*e**2*i*x*
sqrt(-c**2*x**2 + 1)/(96*c**5) - 5*b*e**2*i*asin(c*x)/(96*c**6), Ne(c, 0)),
 (a*(d**2*f*x + d**2*g*x**2/2 + d**2*h*x**3/3 + d**2*i*x**4/4 + d*e*f*x**2
+ 2*d*e*g*x**3/3 + d*e*h*x**4/2 + 2*d*e*i*x**5/5 + e**2*f*x**3/3 + e**2*g*x
**4/4 + e**2*h*x**5/5 + e**2*i*x**6/6), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 840, normalized size of antiderivative = 1.74

$$\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \frac{1}{6}\,ae^2ix^6 + \frac{1}{5}\,ae^2hx^5 + \frac{2}{5}\,adeix^5 + \frac{1}{4}\,ae^2gx^4 + \frac{1}{2}\,adehx^4 + \frac{1}{4}\,ad^2ix^4 + \frac{1}{3}\,ae^2fx^3 + \frac{2}{3}\,adegx^3 + \frac{1}{3}\,ad^2hx^3 + adefx^2 + \frac{1}{2}\,ad^2gx^2 + \frac{1}{2}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g + \frac{2}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2h + \frac{1}{16}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bdeh + \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2h + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd^2i + \frac{2}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bdei + \frac{1}{288}\left(48\,x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right) + ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

```
[In] integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

```
[Out] 1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/2
*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*a*
d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqr
t(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f + 1/4*
(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*
g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^
2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/
c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^2*g + 1/9*(3*x
^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))
*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt
(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e*h + 1/75*(15*x^5*arcsin(
c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqr
t(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^
2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2*i
 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x
^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e*i + 1/288*(48*x^6*arcs
in(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 1
5*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e^2*i + a*d^2*f*x + (
c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1287 vs. $2(449) = 898$.

Time = 0.34 (sec) , antiderivative size = 1287, normalized size of antiderivative = 2.66

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

```
[In] integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

```
[Out] 1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/2
*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*a*
d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*f*x
*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x
^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c + 1/
4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/c^2 +
1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x)/c^2 +
 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*arcsin(c*x)/c^2 + 1/5*(c^2*x
^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)^2*b*d*e*i*x*arcsin(
c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^2*g
*x/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*e*h*x/c^3 - 1/16*(-c^2*x^2 + 1)^(3/2)
*b*d^2*i*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^2*g/c^2
+ 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^2 + 1/4*(c^2*x^2
```

```
- 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*e*h*arcsin(c*x)/c^
4 + 1/4*(c^2*x^2 - 1)^2*b*d^2*i*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^2*h
*x*arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*b*d*e*i*x*arcsin(c*x)/c^4 - 1/9*(-c^
2*x^2 + 1)^(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 - 1/9*(
-c^2*x^2 + 1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^2*g*x/c^3 + 5
/16*sqrt(-c^2*x^2 + 1)*b*d*e*h*x/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^2*i*x/c^
3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2*i*x/c^5 + 1/2*(c^2*x^2 -
1)*b*e^2*g*arcsin(c*x)/c^4 + (c^2*x^2 - 1)*b*d*e*h*arcsin(c*x)/c^4 + 1/2*(c
^2*x^2 - 1)*b*d^2*i*arcsin(c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b*e^2*i*arcsin(c*
x)/c^6 + 1/5*b*e^2*h*x*arcsin(c*x)/c^4 + 2/5*b*d*e*i*x*arcsin(c*x)/c^4 + 1/
3*sqrt(-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e*g/c^3 + 1/3
*sqrt(-c^2*x^2 + 1)*b*d^2*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
*e^2*h/c^5 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e*i/c^5 - 13/144*(
-c^2*x^2 + 1)^(3/2)*b*e^2*i*x/c^5 + 5/32*b*e^2*g*arcsin(c*x)/c^4 + 5/16*b*d
*e*h*arcsin(c*x)/c^4 + 5/32*b*d^2*i*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b
*e^2*i*arcsin(c*x)/c^6 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^2*h/c^5 - 4/15*(-c^2
*x^2 + 1)^(3/2)*b*d*e*i/c^5 + 11/96*sqrt(-c^2*x^2 + 1)*b*e^2*i*x/c^5 + 1/2*
(c^2*x^2 - 1)*b*e^2*i*arcsin(c*x)/c^6 + 1/5*sqrt(-c^2*x^2 + 1)*b*e^2*h/c^5
+ 2/5*sqrt(-c^2*x^2 + 1)*b*d*e*i/c^5 + 11/96*b*e^2*i*arcsin(c*x)/c^6
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^2\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3),x)
[Out] int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3), x)
```

3.108 $\int (d+ex) (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 308

$$\begin{aligned}
&\int (d+ex) (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx \\
&= \frac{b(25c^2(eg+dh)+12ei)\,x^2\sqrt{1-c^2x^2}}{225c^3}+\frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c}+\frac{beix^4\sqrt{1-c^2x^2}}{25c} \\
&\quad+\frac{b(32(225c^4df+50c^2(eg+dh)+24ei)+225c^2(8c^2(ef+dg)+3(eh+di))\,x)\sqrt{1-c^2x^2}}{7200c^5} \\
&\quad-\frac{b(8c^2(ef+dg)+3(eh+di))\arcsin(cx)}{32c^4}+dfx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}(eh+di)x^4(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))
\end{aligned}$$

```
[Out] -1/32*b*(8*c^2*(d*g+e*f)+3*d*i+3*e*h)*arcsin(c*x)/c^4+d*f*x*(a+b*arcsin(c*x
))+1/2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d*h+e*g)*x^3*(a+b*arcsin(c*x))+
1/4*(d*i+e*h)*x^4*(a+b*arcsin(c*x))+1/5*e*i*x^5*(a+b*arcsin(c*x))+1/225*b*(
25*c^2*(d*h+e*g)+12*e*i)*x^2*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*(d*i+e*h)*x^3*(-
c^2*x^2+1)^(1/2)/c+1/25*b*e*i*x^4*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*c^4*d
*f+1600*c^2*(d*h+e*g)+768*e*i+225*c^2*(8*c^2*(d*g+e*f)+3*d*i+3*e*h)*x)*(-c^
2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4833, 12, 1823, 794, 222}

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))$$
$$+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))$$
$$+\frac{1}{5}eix^5(a+b\arcsin(cx))-\frac{b\arcsin(cx)\left(8c^2(dg+ef)+3(di+eh)\right)}{32c^4}$$
$$+\frac{bx^3\sqrt{1-c^2x^2}(di+eh)}{16c}+\frac{beix^4\sqrt{1-c^2x^2}}{25c}+\frac{bx^2\sqrt{1-c^2x^2}(25c^2(dh+eg)+12ei)}{225c^3}$$
$$+\frac{b\sqrt{1-c^2x^2}(225c^2x(8c^2(dg+ef)+3(di+eh))+32(225c^4df+50c^2(dh+eg)+24ei))}{7200c^5}$$

```
[In] Int[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(25*c^2*(e*g + d*h) + 12*e*i)*x^2*Sqrt[1 - c^2*x^2])/(225*c^3) + (b*(e*h
 + d*i)*x^3*Sqrt[1 - c^2*x^2])/(16*c) + (b*e*i*x^4*Sqrt[1 - c^2*x^2])/(25*c
) + (b*(32*(225*c^4*d*f + 50*c^2*(e*g + d*h) + 24*e*i) + 225*c^2*(8*c^2*(e*
f + d*g) + 3*(e*h + d*i))*x)*Sqrt[1 - c^2*x^2])/(7200*c^5) - (b*(8*c^2*(e*f
 + d*g) + 3*(e*h + d*i))*ArcSin[c*x])/(32*c^4) + d*f*x*(a + b*ArcSin[c*x])
+ ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + ((e*g + d*h)*x^3*(a + b*ArcSin[
c*x]))/3 + ((e*h + d*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*i*x^5*(a + b*ArcSin
[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4833

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, I
nt[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c}, x
] && PolynomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}(eh+di)x^4(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x(60df+30(ef+dg)x+20(eg+dh)x^2+15(eh+di)x^3+12eix^4)}{60\sqrt{1-c^2x^2}}\,dx \\
&= dfx(a+b\arcsin(cx))+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}(eh+di)x^4(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx)) \\
&\quad-\frac{1}{60}(bc)\int\frac{x(60df+30(ef+dg)x+20(eg+dh)x^2+15(eh+di)x^3+12eix^4)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{beix^4\sqrt{1-c^2x^2}}{25c}+dfx(a+b\arcsin(cx)) \\
&\quad+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{4}(eh+di)x^4(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx)) \\
&\quad+\frac{b\int\frac{x(-300c^2df-150c^2(ef+dg)x-4(25c^2(eg+dh)+12ei)x^2-75c^2(eh+di)x^3)}{\sqrt{1-c^2x^2}}\,dx}{300c}
\end{aligned}$$

$$= \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} + \frac{beix^4\sqrt{1-c^2x^2}}{25c} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}(eh+di)x^4(a+b\arcsin(cx)) + \frac{1}{5}eix^5(a+b\arcsin(cx)) - \frac{b\int \frac{x(1200c^4df+75c^2(8c^2(ef+dg)+3(eh+di))x+16c^2(25c^2(eg+dh)+12ei)x^2)}{\sqrt{1-c^2x^2}}dx}{1200c^3}$$

$$= \frac{b(25c^2(eg+dh)+12ei)\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} + \frac{beix^4\sqrt{1-c^2x^2}}{25c} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}(eh+di)x^4(a+b\arcsin(cx)) + \frac{1}{5}eix^5(a+b\arcsin(cx)) + \frac{b\int \frac{x(-16c^2(225c^4df+50c^2(eg+dh)+24ei)-225c^4(8c^2(ef+dg)+3(eh+di))x)}{\sqrt{1-c^2x^2}}dx}{3600c^5}$$

$$= \frac{b(25c^2(eg+dh)+12ei)\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} + \frac{beix^4\sqrt{1-c^2x^2}}{25c} + \frac{b(32(225c^4df+50c^2(eg+dh)+24ei)+225c^2(8c^2(ef+dg)+3(eh+di))\,x)\sqrt{1-c^2x^2}}{7200c^5} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}(eh+di)x^4(a+b\arcsin(cx)) + \frac{1}{5}eix^5(a+b\arcsin(cx)) - \frac{(b(8c^2(ef+dg)+3(eh+di)))\int \frac{1}{\sqrt{1-c^2x^2}}dx}{32c^3}$$

$$= \frac{b(25c^2(eg+dh)+12ei)\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} + \frac{beix^4\sqrt{1-c^2x^2}}{25c} + \frac{b(32(225c^4df+50c^2(eg+dh)+24ei)+225c^2(8c^2(ef+dg)+3(eh+di))\,x)\sqrt{1-c^2x^2}}{7200c^5} - \frac{b(8c^2(ef+dg)+3(eh+di))\arcsin(cx)}{32c^4} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}(eh+di)x^4(a+b\arcsin(cx)) + \frac{1}{5}eix^5(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.82

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(5d(12f+x(6g+x(4h+3ix)))+ex(30f+x(20g+3x(5h+4ix))))+b\sqrt{1-c^2x^2}(768ei+c^2(25}{}$$

[In] Integrate[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]

[Out] (120*a*c^5*x*(5*d*(12*f + x*(6*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x)))) + b*Sqrt[1 - c^2*x^2]*(768*e*i + c^2*(25*d*(64*h + 27*i*x) + e*(1600*g + 675*h*x + 384*i*x^2)) + 2*c^4*(25*d*(144*f + x*(36*g + x*(16*h + 9*i*x))) + e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))))) + 15*b*c*(-120*c^2*(e*f + d*g) - 45*(e*h + d*i) + 8*c^4*x*(5*d*(12*f + x*(6*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x)))))*ArcSin[c*x])/(7200*c^5)

Maple [A] (verified)

Time = 0.09 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.23

method	result
parts	$a\left(\frac{ei\,x^5}{5}+\frac{(di+eh)x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)ei\,x^5}{5}+\frac{c\arcsin(cx)x^4di}{4}+\frac{c\arcsin(cx)eh}{4}\right.}{}$
derivativedivides	$\frac{\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(dci+ech)c^4x^4}{4}+\frac{\left(d\,c^2h+e\,c^2g\right)c^3x^3}{3}+\frac{\left(d\,c^3g+ef\,c^3\right)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\arcsin(\right.}{}}{}$
default	$\frac{\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(dci+ech)c^4x^4}{4}+\frac{\left(d\,c^2h+e\,c^2g\right)c^3x^3}{3}+\frac{\left(d\,c^3g+ef\,c^3\right)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\arcsin(\right.}{}}{}$

[In] int((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/5*e*i*x^5+1/4*(d*i+e*h)*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/5*c*arcsin(c*x)*e*i*x^5+1/4*c*arcsin(c*x)*x^4*d*i+1/4*c*arcsin(c*x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*e*g*x^3+1/2*c*arcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/60/c^4*(12*e*i*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-60*d*c^4*f*(-c^2*x^2+1)^(1/2)+(15*c*d*i+15*c*e*h)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(20*c^2*

d*h+20*c^2*e*g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(3
0*c^3*d*g+30*c^3*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.11

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \frac{1440\,ac^5eix^5+7200\,ac^5dfx+1800\,(ac^5eh+ac^5di)x^4+2400\,(ac^5eg+ac^5dh)x^3+3600\,(ac^5ef+ac^5dg)x}{}$$

[In] integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="frica
s")

[Out] 1/7200*(1440*a*c^5*e*i*x^5 + 7200*a*c^5*d*f*x + 1800*(a*c^5*e*h + a*c^5*d*i
)*x^4 + 2400*(a*c^5*e*g + a*c^5*d*h)*x^3 + 3600*(a*c^5*e*f + a*c^5*d*g)*x^2
 + 15*(96*b*c^5*e*i*x^5 + 480*b*c^5*d*f*x - 120*b*c^3*e*f - 120*b*c^3*d*g +
 120*(b*c^5*e*h + b*c^5*d*i)*x^4 - 45*b*c*e*h - 45*b*c*d*i + 160*(b*c^5*e*g
 + b*c^5*d*h)*x^3 + 240*(b*c^5*e*f + b*c^5*d*g)*x^2)*arcsin(c*x) + (288*b*c
^4*e*i*x^4 + 7200*b*c^4*d*f + 1600*b*c^2*e*g + 1600*b*c^2*d*h + 450*(b*c^4*
e*h + b*c^4*d*i)*x^3 + 768*b*e*i + 32*(25*b*c^4*e*g + 25*b*c^4*d*h + 12*b*c
^2*e*i)*x^2 + 225*(8*b*c^4*e*f + 8*b*c^4*d*g + 3*b*c^2*e*h + 3*b*c^2*d*i)*x
)*sqrt(-c^2*x^2 + 1))/c^5

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 658 vs. 2(292) = 584.

Time = 0.46 (sec) , antiderivative size = 658, normalized size of antiderivative = 2.14

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \begin{cases} adfx+\frac{adgx^2}{2}+\frac{adhx^3}{3}+\frac{adix^4}{4}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+\frac{aehx^4}{4}+\frac{aeix^5}{5}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{bdhx^3\operatorname{asin}(cx)}{3} \\ a\left(dfx+\frac{dgx^2}{2}+\frac{dhx^3}{3}+\frac{dix^4}{4}+\frac{efx^2}{2}+\frac{egx^3}{3}+\frac{ehx^4}{4}+\frac{eix^5}{5}\right) \end{cases}$$

[In] integrate((e*x+d)*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)

[Out] Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*d*i*x**4/4 + a*e*f*x**
2/2 + a*e*g*x**3/3 + a*e*h*x**4/4 + a*e*i*x**5/5 + b*d*f*x*asin(c*x) + b*d*
g*x**2*asin(c*x)/2 + b*d*h*x**3*asin(c*x)/3 + b*d*i*x**4*asin(c*x)/4 + b*e*
f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*x**4*asin(c*x)/4 + b*e*

```
i*x**5*asin(c*x)/5 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2
 + 1)/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*i*x**3*sqrt(-c**2
*x**2 + 1)/(16*c) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c
**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*i*x**4*s
qrt(-c**2*x**2 + 1)/(25*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*
c**2) + 2*b*d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*i*x*sqrt(-c**2*x**2 +
 1)/(32*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e*h*x*sqrt(-c**
2*x**2 + 1)/(32*c**3) + 4*b*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 3*b*d
*i*asin(c*x)/(32*c**4) - 3*b*e*h*asin(c*x)/(32*c**4) + 8*b*e*i*sqrt(-c**2*x
**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x**3/3 + d*i*x*
*4/4 + e*f*x**2/2 + e*g*x**3/3 + e*h*x**4/4 + e*i*x**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 490, normalized size of antiderivative = 1.59

$$
\begin{aligned}
&\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx \\
&= \frac{1}{5}aeix^5 + \frac{1}{4}aehx^4 + \frac{1}{4}adix^4 + \frac{1}{3}aegx^3 + \frac{1}{3}adhx^3 + \frac{1}{2}aefx^2 + \frac{1}{2}adgx^2 \\
&\quad + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bef \\
&\quad + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdg \\
&\quad + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg \\
&\quad + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh \\
&\quad + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)beh \\
&\quad + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bdi \\
&\quad + \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bei \\
&\quad + adfx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bdf}{c}
\end{aligned}
$$

```
[In] integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxim
a")
```

```
[Out] 1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x
^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt
(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x) + c
*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*
b*d*h + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c
^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e*h + 1/32*(8*x^4*arcsin(c*x) +
 (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)
/c^5)*c)*b*d*i + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 +
 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e*i + a*d*f*
x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 692 vs. $2(277) = 554$.

Time = 0.29 (sec) , antiderivative size = 692, normalized size of antiderivative = 2.25

$$\begin{aligned}
&\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx \\
&= \frac{1}{5}\,aeix^5 + \frac{1}{4}\,aehx^4 + \frac{1}{4}\,adix^4 + \frac{1}{3}\,aegx^3 + \frac{1}{3}\,adhx^3 + bdfx\arcsin(cx) + adfx \\
&+ \frac{(c^2x^2-1)begx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)bdhx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4\,c} \\
&+ \frac{\sqrt{-c^2x^2+1}bdgx}{4\,c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2\,c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2\,c^2} \\
&+ \frac{begx\arcsin(cx)}{3\,c^2} + \frac{bdhx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2beix\arcsin(cx)}{5\,c^4} \\
&+ \frac{\sqrt{-c^2x^2+1}bdf}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}behx}{16\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdix}{16\,c^3} + \frac{(c^2x^2-1)aef}{2\,c^2} \\
&+ \frac{(c^2x^2-1)adg}{2\,c^2} + \frac{bef\arcsin(cx)}{4\,c^2} + \frac{bdg\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2beh\arcsin(cx)}{4\,c^4} \\
&+ \frac{(c^2x^2-1)^2bdi\arcsin(cx)}{4\,c^4} + \frac{2\,(c^2x^2-1)beix\arcsin(cx)}{5\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9\,c^3} \\
&- \frac{(-c^2x^2+1)^{\frac{3}{2}}bdh}{9\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}behx}{32\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}bdix}{32\,c^3} \\
&+ \frac{(c^2x^2-1)beh\arcsin(cx)}{2\,c^4} + \frac{(c^2x^2-1)bdi\arcsin(cx)}{2\,c^4} + \frac{beix\arcsin(cx)}{5\,c^4} \\
&+ \frac{\sqrt{-c^2x^2+1}beg}{3\,c^3} + \frac{\sqrt{-c^2x^2+1}bdh}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bei}{25\,c^5} \\
&+ \frac{5\,beh\arcsin(cx)}{32\,c^4} + \frac{5\,bdi\arcsin(cx)}{32\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bei}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}bei}{5\,c^5}
\end{aligned}$$

```
[In] integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac"
)
```

```
[Out] 1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x
^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x)/
c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*x*arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*
e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin
(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*
x)/c^2 + 1/3*b*d*h*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e*i*x*arcsin(c
*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*h*x/c^
3 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*i*x/c^3 + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1
/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e*f*arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c
*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h*arcsin(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b
*d*i*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e*i*x*arcsin(c*x)/c^4 - 1/9*(-c^
2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d*h/c^3 + 5/32*sqrt
(-c^2*x^2 + 1)*b*e*h*x/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*i*x/c^3 + 1/2*(c^2
*x^2 - 1)*b*e*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)*b*d*i*arcsin(c*x)/c^4 +
 1/5*b*e*i*x*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3 + 1/3*sqrt(
-c^2*x^2 + 1)*b*d*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e*i/c^5
 + 5/32*b*e*h*arcsin(c*x)/c^4 + 5/32*b*d*i*arcsin(c*x)/c^4 - 2/15*(-c^2*x^2
 + 1)^(3/2)*b*e*i/c^5 + 1/5*sqrt(-c^2*x^2 + 1)*b*e*i/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3),x)
```

```
[Out] int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3), x)
```

3.109 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 623

$$\begin{aligned}
&\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3} \\
&\quad - \frac{b(eh-di)\arcsin(cx)}{4c^2e^2} - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4} \\
&\quad + \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3} + \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad + \frac{ix^3(a+b\arcsin(cx))}{3e} + \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad + \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad - \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad + \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}$$

```
[Out] -1/4*b*(-d*i+e*h)*arcsin(c*x)/c^2/e^2-1/2*I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f
)*arcsin(c*x)^2/e^4+(d^2*i-d*e*h+e^2*g)*x*(a+b*arcsin(c*x))/e^3+1/2*(-d*i+e
*h)*x^2*(a+b*arcsin(c*x))/e^2+1/3*i*x^3*(a+b*arcsin(c*x))/e-b*(-d^3*i+d^2*e
```

```
*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(e*x+d)/e^4+(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*
(a+b*arcsin(c*x))*ln(e*x+d)/e^4+b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*(-d^
3*i+d^2*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/
(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*polylog(2
,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-d^3*i+
d^2*e*h-d*e^2*g+e^3*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d
^2-e^2)^(1/2)))/e^4+1/9*b*i*x^2*(-c^2*x^2+1)^(1/2)/c/e+1/36*b*(8*e^2*i+36*c
^2*(d^2*i-d*e*h+e^2*g)+9*c^2*e*(-d*i+e*h)*x)*(-c^2*x^2+1)^(1/2)/c^3/e^3
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 623, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.419$, Rules used = {1864, 4837, 12, 6874, 1823, 794, 222, 2451, 4825, 4615, 2221, 2317, 2438}

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{x(a+b\arcsin(cx))(d^2i-deh+e^2g)}{e^3} + \frac{\log(d+ex)(a+b\arcsin(cx))(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} + \frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e} - \frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} - \frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} + \frac{b\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} + \frac{b\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} - \frac{b\arcsin(cx)(eh-di)}{4c^2e^2} - \frac{ib\arcsin(cx)^2(d^3(-i)+d^2eh-de^2g+e^3f)}{2e^4} - \frac{b\arcsin(cx)\log(d+ex)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4} + \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b\sqrt{1-c^2x^2}(4(9c^2(d^2i-deh+e^2g)+2e^2i)+9c^2ex(eh-di))}{36c^3e^3}$$

```
[In] Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] (b*i*x^2*Sqrt[1 - c^2*x^2])/(9*c*e) + (b*(4*(2*e^2*i + 9*c^2*(e^2*g - d*e*h
 + d^2*i)) + 9*c^2*e*(e*h - d*i)*x)*Sqrt[1 - c^2*x^2])/(36*c^3*e^3) - (b*(e
```

```
*h - d*i)*ArcSin[c*x])/(4*c^2*e^2) - ((I/2)*b*(e^3*f - d*e^2*g + d^2*e*h -
d^3*i)*ArcSin[c*x]^2)/e^4 + ((e^2*g - d*e*h + d^2*i)*x*(a + b*ArcSin[c*x]))
/e^3 + ((e*h - d*i)*x^2*(a + b*ArcSin[c*x]))/(2*e^2) + (i*x^3*(a + b*ArcSin
[c*x]))/(3*e) + (b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 -
(I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^4 + (b*(e^3*f - d*e
^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/e^4 - (b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[
c*x]*Log[d + e*x])/e^4 + ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin
[c*x])*Log[d + e*x])/e^4 - (I*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog
[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^4 - (I*b*(e^3*f
 - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqr
t[c^2*d^2 - e^2])])/e^4
```

<u>Rule 12</u>

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

<u>Rule 222</u>

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

<u>Rule 794</u>

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

<u>Rule 1823</u>

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

<u>Rule 1864</u>

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
```

```
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad+\frac{ix^3(a+b\arcsin(cx))}{3e}+\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad-(bc)\int\frac{ex(6d^2i-3de(2h+ix)+e^2(6g+3hx+2ix^2))+6(e^3f-de^2g+d^2eh-d^3i)\log(d+ex)}{6e^4\sqrt{1-c^2x^2}}\,dx \\
&= \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad+\frac{ix^3(a+b\arcsin(cx))}{3e}+\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad-\frac{(bc)\int\frac{ex(6d^2i-3de(2h+ix)+e^2(6g+3hx+2ix^2))+6(e^3f-de^2g+d^2eh-d^3i)\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{6e^4} \\
&= \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad+\frac{ix^3(a+b\arcsin(cx))}{3e}+\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad-\frac{(bc)\int\left(\frac{ex(6(e^2g-deh+d^2i)+3e(eh-di)x+2e^2ix^2)}{\sqrt{1-c^2x^2}}+\frac{6(e^3f-de^2g+d^2eh-d^3i)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4} \\
&= \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad+\frac{ix^3(a+b\arcsin(cx))}{3e}+\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad-\frac{(bc)\int\frac{x(6(e^2g-deh+d^2i)+3e(eh-di)x+2e^2ix^2)}{\sqrt{1-c^2x^2}}\,dx}{6e^3} \\
&\quad-\frac{(bc(e^3f-de^2g+d^2eh-d^3i))\int\frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^4}
\end{aligned}$$

$$= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3} + \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e} - \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{b\int \frac{x(-2(2e^2i+9c^2(e^2g-deh+d^2i))-9c^2e(eh-di)x)}{\sqrt{1-c^2x^2}}\,dx}{18ce^3} + \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\int \frac{\arcsin(cx)}{cd+cex}\,dx}{e^3}$$

$$= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3} + \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3} + \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e} - \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(b(eh-di))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4ce^2} + \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int \frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3} - \frac{b(eh-di)\arcsin(cx)}{4c^2e^2} - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4} + \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3} + \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e} - \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int \frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3} + \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int \frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$
\begin{aligned}
&= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3} \\
&\quad - \frac{b(eh-di)\arcsin(cx)}{4c^2e^2} - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4} \\
&\quad + \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3} \\
&\quad + \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e} \\
&\quad + \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad + \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad - \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad + \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad - \frac{(b(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^4} \\
&\quad - \frac{(b(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^4}
\end{aligned}
$$

$$= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3}$$
$$- \frac{b(eh-di)\arcsin(cx)}{4c^2e^2} - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4}$$
$$+ \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}$$
$$+ \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e}$$
$$+ \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4}$$
$$+ \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$+ \frac{(ib(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^4}$$
$$+ \frac{(ib(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^4}$$

$$= \frac{bix^2\sqrt{1-c^2x^2}}{9ce} + \frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3}$$
$$- \frac{b(eh-di)\arcsin(cx)}{4c^2e^2} - \frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4}$$
$$+ \frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}$$
$$+ \frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} + \frac{ix^3(a+b\arcsin(cx))}{3e}$$
$$+ \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4}$$
$$+ \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

Mathematica [A] (verified)

Time = 0.87 (sec) , antiderivative size = 610, normalized size of antiderivative = 0.98

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{\frac{6be(e^2g-deh+d^2i)\sqrt{1-c^2x^2}}{c} + \frac{3be^2(eh-di)x\sqrt{1-c^2x^2}}{2c} + \frac{2be^3i\sqrt{1-c^2x^2}(2+c^2x^2)}{3c^3} - \frac{3be^2(eh-di)\arcsin(cx)}{2c^2} - 3ib(e^3f-de^2g+a}{}$$

```
[In] Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

```
[Out] ((6*b*e*(e^2*g - d*e*h + d^2*i)*Sqrt[1 - c^2*x^2])/c + (3*b*e^2*(e*h - d*i)
*x*Sqrt[1 - c^2*x^2])/(2*c) + (2*b*e^3*i*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2))/(
3*c^3) - (3*b*e^2*(e*h - d*i)*ArcSin[c*x])/(2*c^2) - (3*I)*b*(e^3*f - d*e^2
*g + d^2*e*h - d^3*i)*ArcSin[c*x]^2 + 6*e*(e^2*g - d*e*h + d^2*i)*x*(a + b*
ArcSin[c*x]) + 3*e^2*(e*h - d*i)*x^2*(a + b*ArcSin[c*x]) + 2*e^3*i*x^3*(a +
 b*ArcSin[c*x]) + 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1
 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 6*b*(e^3*f - d
*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d
+ Sqrt[c^2*d^2 - e^2])] - 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*
x]*Log[d + e*x] + 6*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x])
```

```
*Log[d + e*x] - (6*I)*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e
*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (6*I)*b*(e^3*f - d*e^2*g
 + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2
- e^2])])/(6*e^4)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3400 vs. 2(621) = 1242.

Time = 2.56 (sec) , antiderivative size = 3401, normalized size of antiderivative = 5.46

method	result	size
derivativedivides	Expression too large to display	3401
default	Expression too large to display	3401
parts	Expression too large to display	3403

```
[In] int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/c^2*(1/e^3*(c^3*d^2*i*x-c^3*d*e*h*x+c^3*e^2*g*x-1/2*c^3*d*e*i*x^2+1/
2*c^3*e^2*h*x^2+1/3*i*c^3*x^3*e^2)-c^3*(d^3*i-d^2*e*h+d*e^2*g-e^3*f)/e^4*ln
(c*e*x+c*d))-1/4*b/c/e*arcsin(c*x)*cos(2*arcsin(c*x))*h-1/12*b/c^2*i*arcsin
(c*x)/e*sin(3*arcsin(c*x))-1/2*I*b*c*arcsin(c*x)^2/e*f+b*arcsin(c*x)/e*g*c*
x-I*b*c*d*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/2*I*b*c*arcsin(c*x)^2/e^3*
d^2*h+1/2*I*b*c*arcsin(c*x)^2/e^4*d^3*i+1/2*I*b*c*arcsin(c*x)^2/e^2*d*g-I*b
*c*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/8*b/c/e^2*sin(2*arcsin(c*x))*d*i+
1/4*b/c^2/e*(-c^2*x^2+1)^(1/2)*i+b/e^3*(-c^2*x^2+1)^(1/2)*d^2*i-b/e^2*(-c^2
*x^2+1)^(1/2)*d*h-1/36*b/c^2*i/e*cos(3*arcsin(c*x))+1/8*b/c/e*sin(2*arcsin(
c*x))*h+1/4*b/c/e*arcsin(c*x)*i*x+b*arcsin(c*x)/e^3*d^2*i*c*x-b*arcsin(c*x)
/e^2*d*h*c*x-b*c*e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+
1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c*d*g*ar
csin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c*e*f*arcsin(c*x)/(c^2*d^2-e^2)*l
n((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^
2+e^2)^(1/2)))+I*b*c*e*f/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c*e*f/(c^2*
d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I
*d*c+(-c^2*d^2+e^2)^(1/2)))+1/4*b/c/e^2*arcsin(c*x)*cos(2*arcsin(c*x))*d*i+
b*c*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c^3/e^4*d^5*i/(c^2*
d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(
-I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c/e^2*d^3*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((I
*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^
```

2)^(1/2))-b*c^3/e^4*d^5*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c^3/e^4*d^5*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c/e*d^2*h/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+b/e*(-c^2*x^2+1)^(1/2)*g-b*c^3/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c^3/e^2*d^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c^3/e^4*d^5*i/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^3/e^3*d^4*h/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^3/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2-I*b*c/e^2*d^3*i/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^3/e^3*d^4*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c/e^2*d^3*i/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^3/e*f/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^3/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+I*b*c/e*d^2*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c^3/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c/e*d^2*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c/e*d^2*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^3/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^3/e^3*d^4*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^3/e^3*d^4*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c/e^2*d^3*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c^3/e^2*d^3*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2))))

Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="frica
s")
```

```
[Out] integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b*
f)*arcsin(c*x))/(e*x + d), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2+ix^3)}{d+ex}\,dx$$

```
[In] integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxim
a")
```

```
[Out] a*g*(x/e - d*log(e*x + d)/e^2) - 1/6*a*i*(6*d^3*log(e*x + d)/e^4 - (2*e^2*x
^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2 -
 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*i*x^3 + b*h*x^2 + b*g*x +
b*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac"
)
```

```
[Out] integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{d+ex}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{d+e\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x),x)
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x), x)
```

3.110 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 617

$$\begin{aligned}
&\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx \\
&= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3}+\frac{bix\sqrt{1-c^2x^2}}{4ce^2}-\frac{bi\arcsin(cx)}{4c^2e^2} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4}+\frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} \\
&\quad +\frac{ix^2(a+b\arcsin(cx))}{2e^2}-\frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad +\frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad +\frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}$$

```
[Out] -1/4*b*i*arcsin(c*x)/c^2/e^2-1/2*I*b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)^2/
e^4+(-2*d*i+e*h)*x*(a+b*arcsin(c*x))/e^3+1/2*i*x^2*(a+b*arcsin(c*x))/e^2-(-
d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)-b*(3*d^2*i-2*d*e
*h+e^2*g)*arcsin(c*x)*ln(e*x+d)/e^4+(3*d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin(c*x
))*ln(e*x+d)/e^4+b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^
2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*(3*d^2*i-2*d*e*h+e^2*g)*ar
csin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^
4-I*b*(3*d^2*i-2*d*e*h+e^2*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d
-(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(3*d^2*i-2*d*e*h+e^2*g)*polylog(2,I*e*(I*c*x
+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4+b*c*(-d^3*i+d^2*e*h-d*e
^2*g+e^3*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/
(c^2*d^2-e^2)^(1/2)+b*(-2*d*i+e*h)*(-c^2*x^2+1)^(1/2)/c/e^3+1/4*b*i*x*(-c^2
*x^2+1)^(1/2)/c/e^2
```

Rubi [A] (verified)

Time = 1.08 (sec) , antiderivative size = 617, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.484, Rules used = {1864, 4837, 12, 6874, 267, 327, 222, 739, 210, 2451, 4825, 4615, 2221, 2317, 2438}

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$
$$= \frac{\log(d+ex)(a+b\arcsin(cx))(3d^2i-2deh+e^2g)}{e^4} - \frac{(a+b\arcsin(cx))(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4(d+ex)} + \frac{x(eh-2di)(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{ib(3d^2i-2deh+e^2g)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(3d^2i-2deh+e^2g)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{b\arcsin(cx)(3d^2i-2deh+e^2g)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{b\arcsin(cx)(3d^2i-2deh+e^2g)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^4} - \frac{bi\arcsin(cx)}{4c^2e^2} - \frac{ib\arcsin(cx)^2(3d^2i-2deh+e^2g)}{2e^4} - \frac{b\arcsin(cx)\log(d+ex)(3d^2i-2deh+e^2g)}{e^4} + \frac{bc\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4\sqrt{c^2d^2-e^2}} + \frac{b\sqrt{1-c^2x^2}(eh-2di)}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2}$$

```
[In] Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] (b*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/(c*e^3) + (b*i*x*Sqrt[1 - c^2*x^2])/(4*
c*e^2) - (b*i*ArcSin[c*x])/(4*c^2*e^2) - ((I/2)*b*(e^2*g - 2*d*e*h + 3*d^2*
i)*ArcSin[c*x]^2)/e^4 + ((e*h - 2*d*i)*x*(a + b*ArcSin[c*x]))/e^3 + (i*x^2*
(a + b*ArcSin[c*x]))/(2*e^2) - ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*
ArcSin[c*x]))/(e^4*(d + e*x)) + (b*c*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*Ar
cTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^4*Sqrt[c^2*
d^2 - e^2]) + (b*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*
ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^4 + (b*(e^2*g - 2*d*e*h + 3*d
^2*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2
])])/e^4 - (b*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[d + e*x])/e^4 + (
(e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^4 - (I*b*(e
^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])])/e^4 - (I*b*(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I
*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2} \\
&\quad -\frac{\left(e^3f-de^2g+d^2eh-d^3i\right)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad +\frac{\left(e^2g-2deh+3d^2i\right)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -(bc)\int\frac{2e(eh-2di)x+e^2ix^2+\frac{2\left(-e^3f+de^2g-d^2eh+d^3i\right)}{d+ex}+2\left(e^2g-2deh+3d^2i\right)\log(d+ex)}{2e^4\sqrt{1-c^2x^2}}\,dx \\
&= \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2} \\
&\quad -\frac{\left(e^3f-de^2g+d^2eh-d^3i\right)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad +\frac{\left(e^2g-2deh+3d^2i\right)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -\frac{(bc)\int\frac{2e(eh-2di)x+e^2ix^2+\frac{2\left(-e^3f+de^2g-d^2eh+d^3i\right)}{d+ex}+2\left(e^2g-2deh+3d^2i\right)\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{2e^4}
\end{aligned}$$

$$= \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bc)\int\left(\frac{2e(eh-2di)x}{\sqrt{1-c^2x^2}}+\frac{e^2ix^2}{\sqrt{1-c^2x^2}}-\frac{2(e^3f-de^2g+d^2eh-d^3i)}{(d+ex)\sqrt{1-c^2x^2}}+\frac{2(e^2g-2deh+3d^2i)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^4}$$

$$= \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bci)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{2e^2} - \frac{(bc(eh-2di))\int\frac{x}{\sqrt{1-c^2x^2}}dx}{e^3} - \frac{(bc(e^2g-2deh+3d^2i))\int\frac{\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^4} + \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^4}$$

$$= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bi)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{4ce^2} + \frac{(bc(e^2g-2deh+3d^2i))\int\frac{\arcsin(cx)}{cd+cex}dx}{e^3} - \frac{(bc(e^3f-de^2g+d^2eh-d^3i))\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^4}$$

$$= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} - \frac{bi\arcsin(cx)}{4c^2e^2} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(bc(e^2g-2deh+3d^2i))\,\text{Subst}\left(\int\frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} - \frac{bi\arcsin(cx)}{4c^2e^2} - \frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(bc(e^2g-2deh+3d^2i))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3} + \frac{(bc(e^2g-2deh+3d^2i))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$
\begin{aligned}
&= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} - \frac{bi\arcsin(cx)}{4c^2e^2} \\
&\quad - \frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} \\
&\quad + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad + \frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} \\
&\quad + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad + \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad - \frac{(b(e^2g-2deh+3d^2i))\,\mathrm{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^4} \\
&\quad - \frac{(b(e^2g-2deh+3d^2i))\,\mathrm{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)\,dx, x, \arcsin(cx)\right)}{e^4}
\end{aligned}
$$

$$= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} - \frac{bi\arcsin(cx)}{4c^2e^2} - \frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(ib(e^2g-2deh+3d^2i))\,\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^4} + \frac{(ib(e^2g-2deh+3d^2i))\,\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^4}$$

$$= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3} + \frac{bix\sqrt{1-c^2x^2}}{4ce^2} - \frac{bi\arcsin(cx)}{4c^2e^2} - \frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4} + \frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} + \frac{ix^2(a+b\arcsin(cx))}{2e^2} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{ib(e^2g-2deh+3d^2i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(e^2g-2deh+3d^2i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 593, normalized size of antiderivative = 0.96

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{\frac{2be(eh-2di)\sqrt{1-c^2x^2}}{c} + \frac{be^2ix\sqrt{1-c^2x^2}}{2c} - \frac{be^2i\arcsin(cx)}{2c^2} - ib(e^2g-2deh+3d^2i)\arcsin(cx)^2 + 2e(eh-2di)x(a+b\,\ldots}{}$$

```
[In] Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

```
[Out] ((2*b*e*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/c + (b*e^2*i*x*Sqrt[1 - c^2*x^2])/
(2*c) - (b*e^2*i*ArcSin[c*x])/(2*c^2) - I*b*(e^2*g - 2*d*e*h + 3*d^2*i)*Arc
Sin[c*x]^2 + 2*e*(e*h - 2*d*i)*x*(a + b*ArcSin[c*x]) + e^2*i*x^2*(a + b*Arc
Sin[c*x]) - (2*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(d
+ e*x) + (2*b*c*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcTan[(e + c^2*d*x)/(S
qrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + 2*b*(e^2*g -
2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sq
rt[c^2*d^2 - e^2])] + 2*b*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 - (
I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e^2*g - 2*d*e*h
```

```
+ 3*d^2*i)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*
ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*(e^2*g - 2*d
*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^
2])])/(2*e^4)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2872 vs. 2(616) = 1232.

Time = 3.09 (sec) , antiderivative size = 2873, normalized size of antiderivative = 4.66

method	result	size
parts	Expression too large to display	2873
derivativedivides	Expression too large to display	2934
default	Expression too large to display	2934

```
[In] int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE
)
```

```
[Out] b*c^2/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-2*b*c^2/e^3*h*d^3
*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2
+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*b*c^2/e^3*h*d^3*arcsin(c*x)/(c
^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I
*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c
+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(
1/2)))*d^2+2*I*b*c^2/e^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-3*I*b*c^2/e
^4*i*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+
e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-3*I*b*c^2/e^4*i*d^4/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c
^2*d^2+e^2)^(1/2)))-I*b*c^2/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x
^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+I*b*
arcsin(c*x)^2/e^3*d*h-2*b/e^3*arcsin(c*x)*x*d*i-3/2*I*b*arcsin(c*x)^2/e^4*d
^2*i-b*c*arcsin(c*x)/e/(c*e*x+c*d)*f+2*b*c/e*f/(c^2*d^2-e^2)^(1/2)*arctan(1
/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-2*b/c/e^3*
(-c^2*x^2+1)^(1/2)*d*i-3*b/e^2*i*d^2*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2
)))-3*b/e^2*i*d^2*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*b/e*h*d*arcsi
n(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^
(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+3*I*b/e^2*i*d^2/(c^2*d^2-e^2)*dilog((I
*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^
```

```
2)^(1/2)))-2*I*b/e*h*d/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-2*I*b/e*h*d/(c^2*d^
2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d
*c-(-c^2*d^2+e^2)^(1/2)))+3*I*b/e^2*i*d^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+
2*b*c/e^3*d^2*h/(c^2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-2*b*c/e^2*d*g/(c^2*d^2-e^2)^(1/2)*arctan(
1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+b*c*arcsi
n(c*x)/e^4/(c*e*x+c*d)*d^3*i-b*c*arcsin(c*x)/e^3/(c*e*x+c*d)*d^2*h+b*c*arcs
in(c*x)/e^2/(c*e*x+c*d)*d*g-2*b*c/e^4*d^3*i/(c^2*d^2-e^2)^(1/2)*arctan(1/2*
(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+2*b/e*h*d*arc
sin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2
)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*h*(-c^2*x^2+1)^(1/2)/c/e^2-1/2*I*b
*g*arcsin(c*x)^2/e^2-1/4*b*i*arcsin(c*x)/c^2/e^2+1/4*b*i*x*(-c^2*x^2+1)^(1/
2)/c/e^2-b*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*g*arcsin(c*x)/(c^2
*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d
*c-(-c^2*d^2+e^2)^(1/2)))+b/e^2*arcsin(c*x)*x*h+1/2*b*i/e^2*arcsin(c*x)*x^2
+I*b*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*g/(c^2*d^2-e^2)*dilog((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2
)))+2*I*b*c^2/e^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e^2*g/(c^2
*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(
I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+3*b*c^2/e^4*i*d^4*arcsin(c*x)/(c^2*d^2-e^2
)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2
*d^2+e^2)^(1/2)))+3*b*c^2/e^4*i*d^4*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)
))+a*(1/e^3*(1/2*i*x^2*e-2*d*i*x+e*h*x)-1/e^4*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f
)/(e*x+d)+1/e^4*(3*d^2*i-2*d*e*h+e^2*g)*ln(e*x+d))
```

Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^2}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^2}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fri
cas")
```

```
[Out] integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b*
f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2+ix^3)}{(d+ex)^2}\,dx$$

```
[In] integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="max
ima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="gia
c")
[Out] integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{(d+e\,x)^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2,x)
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2, x)
```

3.111 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1016

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$
$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3}+\frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}-\frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+\frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}+\frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$-\frac{ib(eh-3di)\arcsin(cx)^2}{2e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$
$$-\frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2}-\frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)}$$
$$+\frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}-\frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}}$$
$$+\frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$-\frac{bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+\frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+\frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$-\frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4}+\frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$-\frac{ib(eh-3di)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}-\frac{ib(eh-3di)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

```
[Out] -1/2*I*b*(-3*d*i+e*h)*arcsin(c*x)^2/e^4+i*x*(a+b*arcsin(c*x))/e^3-1/2*(-d^3
*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)^2-(3*d^2*i-2*d*e*h+
e^2*g)*(a+b*arcsin(c*x))/e^4/(e*x+d)+5/2*b*c^3*d^4*i*arctan((c^2*d*x+e)/(c^
2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(3/2)-1/2*b*c*d^2*(3
*c^2*d*h+4*e*i)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/
e^3/(c^2*d^2-e^2)^(3/2)+1/2*b*c*d*(4*e^2*(-2*d*i+e*h)+c^2*(4*d^3*i+d*e^2*g)
)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e
^2)^(3/2)-1/2*b*c*(2*e^4*g-6*d^2*e^2*i-c^2*(-4*d^4*i+d*e^3*f))*arctan((c^2*
d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(3/2)-b*(-
3*d*i+e*h)*arcsin(c*x)*ln(e*x+d)/e^4+(-3*d*i+e*h)*(a+b*arcsin(c*x))*ln(e*x+
d)/e^4+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-
```

```
(c^2*d^2-e^2)^(1/2)))/e^4+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-3*d*i+e*h)*polylog(2,I*e
*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-3*d*i+e*h)
*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4+b*
i*(-c^2*x^2+1)^(1/2)/c/e^3+5/2*b*c*d^3*i*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^
2)/(e*x+d)-1/2*b*c*d^2*(4*d*i+3*e*h)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(
e*x+d)+1/2*b*c*d*(-4*d^2*i+4*d*e*h+e^2*g)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e
^2)/(e*x+d)+1/2*b*c*(2*d^3*i-2*d*e^2*g+e^3*f)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d
^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 1.73 (sec) , antiderivative size = 1016, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.581$, Rules used = {1864, 4837, 12, 6874, 745, 739, 210, 821, 1665, 858, 222, 1668, 2451, 4825, 4615,

2221, 2317, 2438}

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$= \frac{5bc^3i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^4}{2e^4(c^2d^2-e^2)^{3/2}} + \frac{5bci\sqrt{1-c^2x^2}d^3}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$- \frac{bc(3dhc^2+4ei)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^2}{2e^3(c^2d^2-e^2)^{3/2}} - \frac{bc(3eh+4di)\sqrt{1-c^2x^2}d^2}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{bc((4id^3+e^2gd)c^2+4e^2(eh-2di))\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{bc(-4id^2+4ehd+e^2g)\sqrt{1-c^2x^2}d}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4}$$
$$+ \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(3id^2-2ehd+e^2g)(a+b\arcsin(cx))}{e^4(d+ex)}$$
$$- \frac{(-id^3+ehd^2-e^2gd+e^3f)(a+b\arcsin(cx))}{2e^4(d+ex)^2}$$
$$- \frac{bc(2ge^4-6d^2ie^2-c^2(de^3f-4d^4i))\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ib(eh-3di)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(eh-3di)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{bc(2id^3-2e^2gd+e^3f)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$

```
[In] Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] (b*i*Sqrt[1 - c^2*x^2])/(c*e^3) + (5*b*c*d^3*i*Sqrt[1 - c^2*x^2])/(2*e^3*(c
^2*d^2 - e^2)*(d + e*x)) - (b*c*d^2*(3*e*h + 4*d*i)*Sqrt[1 - c^2*x^2])/(2*e
^3*(c^2*d^2 - e^2)*(d + e*x)) + (b*c*d*(e^2*g + 4*d*e*h - 4*d^2*i)*Sqrt[1 -
 c^2*x^2])/(2*e^3*(c^2*d^2 - e^2)*(d + e*x)) + (b*c*(e^3*f - 2*d*e^2*g + 2*
d^3*i)*Sqrt[1 - c^2*x^2])/(2*e^3*(c^2*d^2 - e^2)*(d + e*x)) - ((I/2)*b*(e*h
 - 3*d*i)*ArcSin[c*x]^2)/e^4 + (i*x*(a + b*ArcSin[c*x]))/e^3 - ((e^3*f - d*
e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(2*e^4*(d + e*x)^2) - ((e^2*g
 - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x]))/(e^4*(d + e*x)) + (5*b*c^3*d^4*i
```

```
*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^4*(c^2
*d^2 - e^2)^(3/2)) - (b*c*d^2*(3*c^2*d*h + 4*e*i)*ArcTan[(e + c^2*d*x)/(Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^3*(c^2*d^2 - e^2)^(3/2)) + (b*c*
d*(4*e^2*(e*h - 2*d*i) + c^2*(d*e^2*g + 4*d^3*i))*ArcTan[(e + c^2*d*x)/(Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^4*(c^2*d^2 - e^2)^(3/2)) - (b*c*
(2*e^4*g - 6*d^2*e^2*i - c^2*(d*e^3*f - 4*d^4*i))*ArcTan[(e + c^2*d*x)/(Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*e^4*(c^2*d^2 - e^2)^(3/2)) + (b*(e
*h - 3*d*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
 - e^2])])/e^4 + (b*(e*h - 3*d*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^4 - (b*(e*h - 3*d*i)*ArcSin[c*x]*Log[d +
 e*x])/e^4 + ((e*h - 3*d*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^4 - (I*b*(e
*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]
)/e^4 - (I*b*(e*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c
^2*d^2 - e^2])])/e^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
```

```
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 858

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} - (bc)\int \frac{-5d^3i+d^2e(3h-4ix)-e^3(f+2gx-2ix^3)+de^2(-g+4x(h+ix))+2(eh-3di)(d+ex)^2\log}{2e^4(d+ex)^2\sqrt{1-c^2x^2}}$$

$$= \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bc)\int \frac{-5d^3i+d^2e(3h-4ix)-e^3(f+2gx-2ix^3)+de^2(-g+4x(h+ix))+2(eh-3di)(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e^4}$$

$$= \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bc)\int \left(-\frac{5d^3i}{(d+ex)^2\sqrt{1-c^2x^2}} - \frac{d^2e(-3h+4ix)}{(d+ex)^2\sqrt{1-c^2x^2}} + \frac{de^2(-g+4hx+4ix^2)}{(d+ex)^2\sqrt{1-c^2x^2}} + \frac{e^3(-f-2gx+2ix^3)}{(d+ex)^2\sqrt{1-c^2x^2}} + \frac{2(eh-3di)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)}{2e^4}$$

$$= \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(bcd^2)\int \frac{-3h+4ix}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e^3} - \frac{(bcd)\int \frac{-g+4hx+4ix^2}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e^2} - \frac{(bc)\int \frac{-f-2gx+2ix^3}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e} + \frac{(5bcd^3i)\int \frac{1}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{2e^4} - \frac{(bc(eh-3di))\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^4}$$

$$= \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{\left(e^3f-de^2g+d^2eh-d^3i\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{\left(e^2g-2deh+3d^2i\right)(a+b\arcsin(cx))}{e^4(d+ex)} - \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bcd)\int \frac{-c^2dg-4eh+4di+4\left(\frac{c^2d^2}{e}-e\right)ix}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^2\left(c^2d^2-e^2\right)} - \frac{(bc)\int \frac{-c^2df+2eg-\frac{2d^2i}{e}+2d\left(1-\frac{c^2d^2}{e^2}\right)ix+2\left(\frac{c^2d^2}{e}-e\right)ix^2}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e\left(c^2d^2-e^2\right)} + \frac{(5bc^3d^4i)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^4\left(c^2d^2-e^2\right)} + \frac{(bc(eh-3di))\int \frac{\arcsin(cx)}{cd+cex}\,dx}{e^3} - \frac{(bcd^2(3c^2dh+4ei))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^3\left(c^2d^2-e^2\right)}$$

$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{\left(e^3f-de^2g+d^2eh-d^3i\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{\left(e^2g-2deh+3d^2i\right)(a+b\arcsin(cx))}{e^4(d+ex)} - \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{b\int \frac{c^2e\left(c^2def-2e^2g+2d^2i\right)+4c^2d(cd-e)(cd+e)ix}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2ce^3\left(c^2d^2-e^2\right)} - \frac{(2bcdi)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{e^4} - \frac{(5bc^3d^4i)\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e^4\left(c^2d^2-e^2\right)} + \frac{(bc(eh-3di))\text{Subst}\left(\int \frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^3} + \frac{(bcd^2(3c^2dh+4ei))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e^3\left(c^2d^2-e^2\right)} + \frac{(bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^4\left(c^2d^2-e^2\right)}$$

$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$- \frac{2bdi\arcsin(cx)}{e^4} - \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3}$$
$$- \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2}$$
$$- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$- \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} - \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4}$$
$$+ \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(2bcdi)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{e^4}$$
$$+ \frac{(bc(eh-3di))\text{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^3}$$
$$+ \frac{(bc(eh-3di))\text{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^3}$$
$$- \frac{(bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i)))\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)}$$
$$- \frac{(bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{2e^4(c^2d^2-e^2)}$$

$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$- \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3}$$
$$- \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2}$$
$$- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$- \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{(b(eh-3di))\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^4}$$
$$- \frac{(b(eh-3di))\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^4}$$
$$+ \frac{(bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i)))\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)}$$

$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}} - \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} + \frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}} - \frac{bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}} + \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} + \frac{(ib(eh-3di))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^4} + \frac{(ib(eh-3di))\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{e^4}$$

$$
\begin{aligned}
&= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} \\
&+ \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3\left(c^2d^2-e^2\right)(d+ex)} \\
&- \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3} \\
&- \frac{\left(e^3f-de^2g+d^2eh-d^3i\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2} \\
&- \frac{\left(e^2g-2deh+3d^2i\right)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4\left(c^2d^2-e^2\right)^{3/2}} \\
&- \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3\left(c^2d^2-e^2\right)^{3/2}} \\
&+ \frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4\left(c^2d^2-e^2\right)^{3/2}} \\
&- \frac{bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4\left(c^2d^2-e^2\right)^{3/2}} \\
&+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&- \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&- \frac{ib(eh-3di)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(eh-3di)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 11.06 (sec) , antiderivative size = 1556, normalized size of antiderivative = 1.53

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$= \frac{aix}{e^3} + \frac{-ae^3f+ade^2g-ad^2eh+ad^3i}{2e^4(d+ex)^2} + \frac{-ae^2g+2adeh-3ad^2i}{e^4(d+ex)}$$

$$+ bf\left(-\frac{c\sqrt{1+\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}}\sqrt{1+\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex}}\operatorname{AppellF1}\left(2,\frac{1}{2},\frac{1}{2},3,-\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex},-\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{4e^2(d+ex)\sqrt{1-c^2x^2}}\right.$$

$$\left.-\frac{\arcsin(cx)}{2e(d+ex)^2}\right) + \frac{(aeh-3adi)\log(d+ex)}{e^4} + bg\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^2}\right.$$

$$\left.-\frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e}\right)$$

$$+ bi\left(\frac{\sqrt{1-c^2x^2}+cx\arcsin(cx)}{ce^3}+\frac{3d^2\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^4}\right.$$

$$-\frac{d^3\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e^3}$$

$$-\frac{3d\left(-\frac{i\arcsin(cx)^2}{2e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{i\operatorname{PolyLog}\left(2,-\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\right.}{e^3}$$

$$+ bh\left(-\frac{2d\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^3}\right.$$

```
[In] Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

```
[Out] (a*i*x)/e^3 + (-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(2*e^4*(d + e*
x)^2) + (-(a*e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(e^4*(d + e*x)) + b*f*(-1/4*(c
*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*Sqrt[1 + (-d + Sqrt[c^(-2)]*e)/(
d + e*x)]*AppellF1[2, 1/2, 1/2, 3, -((-d + Sqrt[c^(-2)]*e)/(d + e*x)), -((-
d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d + e*x)*Sqrt[1 - c^2*x^2]) - ArcSin
[c*x]/(2*e*(d + e*x)^2)) + ((a*e*h - 3*a*d*i)*Log[d + e*x])/e^4 + b*g*((-(A
rcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sqrt[1 - c^2*x^2])/((c^2*d
^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log
[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c
^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2]))
)/(2*e)) + b*i*((Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x])/(c*e^3) + (3*d^2*(-(A
rcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]))/e^4 - (d^3*((c*Sqrt[1 - c^2*x^2])/((c^
2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] +
Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1
- c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2
])))/(2*e^3) - (3*d*(((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin[c*x]*Log[1 - (I*e
*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (ArcSin[c*x]*Log[1 -
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, ((-
I)*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e))/e^3) + b*h*((-2*d
*(-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*S
qrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]))/e^3 + (d^2*((c*Sqrt[1 - c^2*x^2])
/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[
4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sq
rt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2
- e^2])))/(2*e^2) + (((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin[c*x]*Log[1 - (I*e
*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (ArcSin[c*x]*Log[1 -
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, ((-
I)*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e)/e^2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3609 vs. $2(979) = 1958$.

Time = 7.05 (sec) , antiderivative size = 3610, normalized size of antiderivative = 3.55

method	result	size
derivativedivides	Expression too large to display	3610
default	Expression too large to display	3610
parts	Expression too large to display	3617

```
[In] int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE
)
```

```
[Out] 1/c*(a*(i/e^3*c*x+1/2*c^3*(d^3*i-d^2*e*h+d*e^2*g-e^3*f)/e^4/(c*e*x+c*d)^2-c
^2/e^4*(3*d^2*i-2*d*e*h+e^2*g)/(c*e*x+c*d)-c/e^4*(3*d*i-e*h)*ln(c*e*x+c*d))
+b*(2*I/(c^2*d^2-e^2)^(3/2)*c^2*g*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1
/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))-1/2*c^2*(-(-c^2*x^2+1)^(1/2)*c^2*d*e^4*f-e
^4*c*g*arcsin(c*x)*d+3*e^3*c*d^2*h*arcsin(c*x)-5*e^2*c*d^3*i*arcsin(c*x)-3*
e*c^3*d^4*h*arcsin(c*x)+e^2*c^3*d^3*g*arcsin(c*x)+e^3*c^3*d^2*f*arcsin(c*x)
-2*arcsin(c*x)*e^5*g*c*x-I*c^3*d^3*e^2*g+I*c^3*d^4*e*h+I*c^3*d^2*e^3*f+(-c^
2*x^2+1)^(1/2)*c^2*d^4*e*i-(-c^2*x^2+1)^(1/2)*c^2*d^3*e^2*h+(-c^2*x^2+1)^(1
/2)*c^2*d^2*e^3*g+I*c^3*d^2*e^3*h*x^2+(-c^2*x^2+1)^(1/2)*c^2*d^3*e^2*i*x-(-
c^2*x^2+1)^(1/2)*c^2*d^2*e^3*h*x+(-c^2*x^2+1)^(1/2)*c^2*d*e^4*g*x+I*c^3*e^5
*f*x^2-(-c^2*x^2+1)^(1/2)*c^2*e^5*f*x-6*arcsin(c*x)*d^2*e^3*i*c*x+4*arcsin(
c*x)*d*e^4*h*c*x-I*c^3*d^5*i-e^5*c*f*arcsin(c*x)+5*c^3*d^5*i*arcsin(c*x)+2*
I*c^3*d^3*e^2*h*x-2*I*c^3*d^2*e^3*g*x+2*I*c^3*d*e^4*f*x-I*c^3*d^3*e^2*i*x^2
-I*c^3*d*e^4*g*x^2-2*I*c^3*d^4*e*i*x+6*arcsin(c*x)*c^3*d^4*e*i*x-4*arcsin(c
*x)*c^3*d^3*e^2*h*x+2*arcsin(c*x)*c^3*d^2*e^3*g*x)/(c^2*d^2-e^2)/(c*e*x+c*d
)^2/e^4-I/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(
1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e^3/(c^2*d^2
-e^2)*c^3*h*d^2*arcsin(c*x)^2-I/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4*dilog((I*d*c+
(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1
/2)))+2*I/e/(c^2*d^2-e^2)^2*c^3*h*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e
+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2-2/e/(c^2*d^2-e^2)^
2*c^3*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(
1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+1/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4*arc
sin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))-3/(c^2*d^2-e^2)^2*c*i*d*arcsin(c*x)*ln((-I*d*c-(I*
c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2
)))-3/(c^2*d^2-e^2)^2*c*i*d*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/2*I*c*arcsin(c*x)
^2*h/e^3+e/(c^2*d^2-e^2)^2*c*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*e/(c^2*d^2-e^2
)^2*c*h*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*
d*c+(-c^2*d^2+e^2)^(1/2)))+I/e/(c^2*d^2-e^2)*c*h*arcsin(c*x)^2+e/(c^2*d^2-e
^2)^2*c*h*arcsin(c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2
)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*e/(c^2*d^2-e^2)^2*c*h*dilog((-I*d
*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2
)^(1/2)))+3*I/(c^2*d^2-e^2)^2*c*i*d*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2)
```

```
)*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))+3*I/(c^2*d^2-e^2)^
2*c*i*d*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*
d*c+(-c^2*d^2+e^2)^(1/2)))-3/2*I*c*arcsin(c*x)^2/e^4*d*i+1/2*(-I*(-c^2*x^2+
1)^(1/2)+c*x)*i*(arcsin(c*x)+I)/e^3+1/2*(c*x+I*(-c^2*x^2+1)^(1/2))*i*(arcsi
n(c*x)-I)/e^3-I/e/(c^2*d^2-e^2)^(3/2)*c^4*d*f*arctanh(1/2*(2*I*e*(I*c*x+(-c
^2*x^2+1)^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))+1/e^3/(c^2*d^2-e^2)^2*c^5*h*d^
4*arcsin(c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))
/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-3/e^4/(c^2*d^2-e^2)^2*c^5*i*d^5*arcsin(c*x)
*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^
2*d^2+e^2)^(1/2)))-3/e^4/(c^2*d^2-e^2)^2*c^5*i*d^5*arcsin(c*x)*ln((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2
)))+3*I/e^4/(c^2*d^2-e^2)^2*c^5*i*d^5*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-6*I/e^2/(c^2*d^2-e
^2)^2*c^3*i*d^3*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(
1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-4*I/e/(c^2*d^2-e^2)^(3/2)*c^2*d*h*arct
anh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))+6*I/e
^2/(c^2*d^2-e^2)^(3/2)*c^2*d^2*i*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/
2))-2*d*c)/(c^2*d^2-e^2)^(1/2))-5*I/e^4/(c^2*d^2-e^2)^(3/2)*c^4*d^4*i*arcta
nh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))-3*I/e^
2/(c^2*d^2-e^2)*c*i*d*arcsin(c*x)^2+6/e^2/(c^2*d^2-e^2)^2*c^3*i*d^3*arcsin(
c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+
(-c^2*d^2+e^2)^(1/2)))+6/e^2/(c^2*d^2-e^2)^2*c^3*i*d^3*arcsin(c*x)*ln((I*d*
c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^
(1/2)))-2/e/(c^2*d^2-e^2)^2*c^3*h*arcsin(c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1
)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2-I/e^2/(
c^2*d^2-e^2)^(3/2)*c^4*d^2*g*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-
2*d*c)/(c^2*d^2-e^2)^(1/2))-6*I/e^2/(c^2*d^2-e^2)^2*c^3*i*d^3*dilog((I*d*c+
(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1
/2)))+3*I/e^3/(c^2*d^2-e^2)^(3/2)*c^4*d^3*h*arctanh(1/2*(2*I*e*(I*c*x+(-c^2
*x^2+1)^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))+3*I/e^4/(c^2*d^2-e^2)^2*c^5*i*d^
5*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+
(-c^2*d^2+e^2)^(1/2)))+2*I/e/(c^2*d^2-e^2)^2*c^3*h*dilog((-I*d*c-(I*c*x+(-c
^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2
+3*I/e^4/(c^2*d^2-e^2)*c^3*i*d^3*arcsin(c*x)^2))
```

Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^3}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fri
cas")
```

```
[Out] integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b*
f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2+ix^3)}{(d+ex)^3}\,dx$$

```
[In] integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="gia
c")
```

```
[Out] integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))\,(i\,x^3+h\,x^2+g\,x+f)}{(d+e\,x)^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3, x)
```

3.112 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1278

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$
$$= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2}$$
$$+ \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2}$$
$$- \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3}$$
$$- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}$$
$$+ \frac{bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}}$$
$$- \frac{11bc^3d^3(2c^2d^2+e^2)\,i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bc^3d^2(4c^2d^2h+e(2eh+81di))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

```
[Out] -I*b*i*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/
e^4-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)^3-1/2*
(3*d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin(c*x))/e^4/(e*x+d)^2-(-3*d*i+e*h)*(a+b*a
```

```
rcsin(c*x))/e^4/(e*x+d)+1/12*b*c*(4*c^4*d^2*f+12*e^2*h+c^2*(6*d^2*h-9*d*e*g
+2*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e/(c^
2*d^2-e^2)^(5/2)-11/12*b*c^3*d^3*(2*c^2*d^2+e^2)*i*arctan((c^2*d*x+e)/(c^2*
d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(5/2)+1/12*b*c^3*d^2*(
4*c^2*d^2*h+e*(81*d*i+2*e*h))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*
x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(5/2)+1/12*b*c*d*(2*c^4*d^2*g-36*e^2*i+c^2*
(-18*d^2*i-18*d*e*h+e^2*g))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^
2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)-b*i*arcsin(c*x)*ln(e*x+d)/e^4+i*(a+b*ar
csin(c*x))*ln(e*x+d)/e^4+b*i*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*i*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+
1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*b*i*polylog(2,I*e*(I*c*x+(-c^2*x
^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-1/2*I*b*i*arcsin(c*x)^2/e^4+1/1
2*b*c*(6*d^2*h-3*d*e*g+2*e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d
)^2-11/12*b*c*d^3*i*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)^2+1/12*b*c
*d^2*(27*d*i+2*e*h)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)^2+1/12*b*c
*d*(-18*d^2*i-6*d*e*h+e^2*g)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)^2
-1/4*b*c*(2*e^2*(-4*d*h+e*g)-c^2*d*(-2*d^2*h-d*e*g+2*e^2*f))*(-c^2*x^2+1)^(
1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)-11/4*b*c^3*d^4*i*(-c^2*x^2+1)^(1/2)/e^3/(c
^2*d^2-e^2)^2/(e*x+d)+1/4*b*c*d^2*(18*e^2*i+c^2*d*(9*d*i+2*e*h))*(-c^2*x^2+
1)^(1/2)/e^3/(c^2*d^2-e^2)^2/(e*x+d)-1/4*b*c*d*(4*e^2*(6*d*i+e*h)-c^2*d*(6*
d^2*i-2*d*e*h+e^2*g))*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)^2/(e*x+d)
```

Rubi [A] (verified)

Time = 1.89 (sec) , antiderivative size = 1278, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.548$, Rules used = {1864, 4837, 12, 6874, 759, 821, 739, 210, 849, 1665, 222, 2451, 4825, 4615, 2221,

2317, 2438}

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$= -\frac{11bc^3i\sqrt{1-c^2x^2}d^4}{4e^3(c^2d^2-e^2)^2(d+ex)} - \frac{11bc^3(2c^2d^2+e^2)\,i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^3}{12e^4(c^2d^2-e^2)^{5/2}}$$
$$-\frac{11bci\sqrt{1-c^2x^2}d^3}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bc^3(4c^2hd^2+e(2eh+81di))\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^2}{12e^3(c^2d^2-e^2)^{5/2}}$$
$$+\frac{bc(d(2eh+9di)c^2+18e^2i)\sqrt{1-c^2x^2}d^2}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bc(2eh+27di)\sqrt{1-c^2x^2}d^2}{12e^3(c^2d^2-e^2)(d+ex)^2}$$
$$+\frac{bc(2d^2gc^4+(-18id^2-18ehd+e^2g)c^2-36e^2i)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d}{12e^2(c^2d^2-e^2)^{5/2}}$$
$$-\frac{bc(4e^2(eh+6di)-c^2d(6id^2-2ehd+e^2g))\sqrt{1-c^2x^2}d}{4e^3(c^2d^2-e^2)^2(d+ex)}$$
$$+\frac{bc(-18id^2-6ehd+e^2g)\sqrt{1-c^2x^2}d}{12e^3(c^2d^2-e^2)(d+ex)^2} - \frac{ibi\arcsin(cx)^2}{2e^4}$$
$$-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} - \frac{(3id^2-2ehd+e^2g)(a+b\arcsin(cx))}{2e^4(d+ex)^2}$$
$$-\frac{(-id^3+ehd^2-e^2gd+e^3f)(a+b\arcsin(cx))}{3e^4(d+ex)^3}$$
$$+\frac{bc(4d^2fc^4+(6hd^2-9egd+2e^2f)c^2+12e^2h)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}}$$
$$+\frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$-\frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$-\frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$-\frac{bc(2e^2(eg-4dh)-c^2d(-2hd^2-egd+2e^2f))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)}$$
$$+\frac{bc(6hd^2-3egd+2e^2f)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2}$$

```
[In] Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

```
[Out] (b*c*(2*e^2*f - 3*d*e*g + 6*d^2*h)*Sqrt[1 - c^2*x^2])/(12*e^2*(c^2*d^2 - e^
2)*(d + e*x)^2) - (11*b*c*d^3*i*Sqrt[1 - c^2*x^2])/(12*e^3*(c^2*d^2 - e^2)*
(d + e*x)^2) + (b*c*d^2*(2*e*h + 27*d*i)*Sqrt[1 - c^2*x^2])/(12*e^3*(c^2*d^
```

```
2 - e^2)*(d + e*x)^2) + (b*c*d*(e^2*g - 6*d*e*h - 18*d^2*i)*Sqrt[1 - c^2*x^
2])/(12*e^3*(c^2*d^2 - e^2)*(d + e*x)^2) - (b*c*(2*e^2*(e*g - 4*d*h) - c^2*
d*(2*e^2*f - d*e*g - 2*d^2*h))*Sqrt[1 - c^2*x^2])/(4*e^2*(c^2*d^2 - e^2)^2*
(d + e*x)) - (11*b*c^3*d^4*i*Sqrt[1 - c^2*x^2])/(4*e^3*(c^2*d^2 - e^2)^2*(d
 + e*x)) + (b*c*d^2*(18*e^2*i + c^2*d*(2*e*h + 9*d*i))*Sqrt[1 - c^2*x^2])/(
4*e^3*(c^2*d^2 - e^2)^2*(d + e*x)) - (b*c*d*(4*e^2*(e*h + 6*d*i) - c^2*d*(e
^2*g - 2*d*e*h + 6*d^2*i))*Sqrt[1 - c^2*x^2])/(4*e^3*(c^2*d^2 - e^2)^2*(d +
 e*x)) - ((I/2)*b*i*ArcSin[c*x]^2)/e^4 - ((e^3*f - d*e^2*g + d^2*e*h - d^3*
i)*(a + b*ArcSin[c*x]))/(3*e^4*(d + e*x)^3) - ((e^2*g - 2*d*e*h + 3*d^2*i)*
(a + b*ArcSin[c*x]))/(2*e^4*(d + e*x)^2) - ((e*h - 3*d*i)*(a + b*ArcSin[c*x
]))/(e^4*(d + e*x)) + (b*c*(4*c^4*d^2*f + 12*e^2*h + c^2*(2*e^2*f - 9*d*e*g
 + 6*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])
/(12*e*(c^2*d^2 - e^2)^(5/2)) - (11*b*c^3*d^3*(2*c^2*d^2 + e^2)*i*ArcTan[(e
 + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(12*e^4*(c^2*d^2 - e^
2)^(5/2)) + (b*c^3*d^2*(4*c^2*d^2*h + e*(2*e*h + 81*d*i))*ArcTan[(e + c^2*d
*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(12*e^3*(c^2*d^2 - e^2)^(5/2)
) + (b*c*d*(2*c^4*d^2*g - 36*e^2*i + c^2*(e^2*g - 18*d*e*h - 18*d^2*i))*Arc
Tan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(12*e^2*(c^2*d^
2 - e^2)^(5/2)) + (b*i*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - S
qrt[c^2*d^2 - e^2])])/e^4 + (b*i*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])])/e^4 - (b*i*ArcSin[c*x]*Log[d + e*x])/e^4 +
(i*(a + b*ArcSin[c*x])*Log[d + e*x])/e^4 - (I*b*i*PolyLog[2, (I*e*E^(I*ArcS
in[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^4 - (I*b*i*PolyLog[2, (I*e*E^(I*A
rcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 759

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

integral

$$= -\frac{(e^3f - de^2g + d^2eh - d^3i)(a + b\arcsin(cx))}{3e^4(d+ex)^3} - \frac{(e^2g - 2deh + 3d^2i)(a + b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh - 3di)(a + b\arcsin(cx))}{e^4(d+ex)} + \frac{i(a + b\arcsin(cx))\log(d+ex)}{e^4} - (bc)\int \frac{11d^3i + d^2e(-2h + 27ix) - e^3(2f + 3x(g + 2hx)) - de^2(g + 6x(h - 3ix)) + 6i(d+ex)^3\log(d+}{6e^4(d+ex)^3\sqrt{1-c^2x^2}}$$

$$= -\frac{(e^3f - de^2g + d^2eh - d^3i)(a + b\arcsin(cx))}{3e^4(d+ex)^3} - \frac{(e^2g - 2deh + 3d^2i)(a + b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh - 3di)(a + b\arcsin(cx))}{e^4(d+ex)} + \frac{i(a + b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bc)\int \frac{11d^3i + d^2e(-2h+27ix) - e^3(2f+3x(g+2hx)) - de^2(g+6x(h-3ix)) + 6i(d+ex)^3\log(d+ex)}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^4}$$

$$= -\frac{(e^3f - de^2g + d^2eh - d^3i)(a + b\arcsin(cx))}{3e^4(d+ex)^3} - \frac{(e^2g - 2deh + 3d^2i)(a + b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh - 3di)(a + b\arcsin(cx))}{e^4(d+ex)} + \frac{i(a + b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bc)\int \left(\frac{11d^3i}{(d+ex)^3\sqrt{1-c^2x^2}} + \frac{d^2e(-2h+27ix)}{(d+ex)^3\sqrt{1-c^2x^2}} - \frac{e^3(2f+3gx+6hx^2)}{(d+ex)^3\sqrt{1-c^2x^2}} + \frac{de^2(-g-6hx+18ix^2)}{(d+ex)^3\sqrt{1-c^2x^2}} + \frac{6i\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4}$$

$$= -\frac{(e^3f - de^2g + d^2eh - d^3i)(a + b\arcsin(cx))}{3e^4(d+ex)^3} - \frac{(e^2g - 2deh + 3d^2i)(a + b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh - 3di)(a + b\arcsin(cx))}{e^4(d+ex)} + \frac{i(a + b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bcd^2)\int \frac{-2h+27ix}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^3} - \frac{(bcd)\int \frac{-g-6hx+18ix^2}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^2} + \frac{(bc)\int \frac{2f+3gx+6hx^2}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e} - \frac{(bci)\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^4} - \frac{(11bcd^3i)\int \frac{1}{(d+ex)^3\sqrt{1-c^2x^2}}\,dx}{6e^4}$$

$$
\begin{aligned}
&= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&\quad + \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&\quad - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3} \\
&\quad - \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} \\
&\quad - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} - \frac{bi\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bcd^2)\int\frac{-2(2c^2dh+27ei)+c^2(2eh+27di)x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e^3(c^2d^2-e^2)} \\
&\quad - \frac{(bcd)\int\frac{-2(c^2dg-6eh-18di)-\left(36ei-c^2\left(eg-6dh+\frac{18d^2i}{e}\right)\right)x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e^2(c^2d^2-e^2)} \\
&\quad + \frac{(bc)\int\frac{2(2c^2df-3eg+6dh)-\left(12eh+c^2\left(2ef-3dg-\frac{6d^2h}{e}\right)\right)x}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e(c^2d^2-e^2)} \\
&\quad + \frac{(bci)\int\frac{\arcsin(cx)}{cd+cex}\,dx}{e^3} + \frac{(11bc^3d^3i)\int\frac{-2d+ex}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{12e^4(c^2d^2-e^2)}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2\left(c^2d^2-e^2\right)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3\left(c^2d^2-e^2\right)(d+ex)^2} \\
&+ \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3\left(c^2d^2-e^2\right)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3\left(c^2d^2-e^2\right)(d+ex)^2} \\
&- \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2\left(c^2d^2-e^2\right)^2(d+ex)} \\
&- \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3\left(c^2d^2-e^2\right)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3\left(c^2d^2-e^2\right)^2(d+ex)} \\
&- \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3\left(c^2d^2-e^2\right)^2(d+ex)} \\
&- \frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{3e^4(d+ex)^3} \\
&- \frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&- \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&+ \frac{(bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{12e\left(c^2d^2-e^2\right)^2} \\
&+ \frac{(bci)\text{Subst}\left(\int\frac{x\cos(x)}{c^2d+ce\sin(x)}\,dx,x,\arcsin(cx)\right)}{e^3} \\
&- \frac{(11bc^3d^3(2c^2d^2+e^2)\,i)\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{12e^4\left(c^2d^2-e^2\right)^2} \\
&+ \frac{(bc^3d^2(4c^2d^2h+e(2eh+81di)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{12e^3\left(c^2d^2-e^2\right)^2} \\
&+ \frac{(bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{12e^2\left(c^2d^2-e^2\right)^2}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&+ \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&- \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3} \\
&- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&- \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&- \frac{(bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h)))\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^2} \\
&+ \frac{(bci)\text{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3} \\
&+ \frac{(bci)\text{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^3} \\
&+ \frac{(11bc^3d^3(2c^2d^2+e^2)\,i)\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^2} \\
&- \frac{(bc^3d^2(4c^2d^2h+e(2eh+81di)))\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^2} \\
&- \frac{(bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i)))\,\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^2}
\end{aligned}
$$

$$= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} - \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)} - \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} - \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} - \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3} - \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}} - \frac{11bc^3d^3(2c^2d^2+e^2)i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^{5/2}} + \frac{bc^3d^2(4c^2d^2h+e(2eh+81di))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^{5/2}} + \frac{bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^{5/2}} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} - \frac{(bi)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d-c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^4} - \frac{(bi)\text{Subst}\left(\int\log\left(1-\frac{icee^{ix}}{c^2d+c\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^4}$$

$$
\begin{aligned}
&= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&+ \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&- \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&- \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3} \\
&- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&+ \frac{bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}} \\
&- \frac{11bc^3d^3(2c^2d^2+e^2)\,i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^{5/2}} \\
&+ \frac{bc^3d^2(4c^2d^2h+e(2eh+81di))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^{5/2}} \\
&+ \frac{bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^{5/2}} \\
&+ \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&- \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&+ \frac{(ibi)\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d-c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^4} \\
&+ \frac{(ibi)\text{Subst}\left(\int\frac{\log\left(1-\frac{icex}{c^2d+c\sqrt{c^2d^2-e^2}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{e^4}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&\quad + \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} \\
&\quad - \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)} \\
&\quad - \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&\quad - \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} \\
&\quad - \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3} \\
&\quad - \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad + \frac{bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}} \\
&\quad - \frac{11bc^3d^3(2c^2d^2+e^2)\,i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^{5/2}} \\
&\quad + \frac{bc^3d^2(4c^2d^2h+e(2eh+81di))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^{5/2}} \\
&\quad + \frac{bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^{5/2}} \\
&\quad + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad - \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad - \frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ibi\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}
$$

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 8.96 (sec) , antiderivative size = 1921, normalized size of antiderivative = 1.50

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$= \frac{-ae^3f+ade^2g-ad^2eh+ad^3i}{3e^4(d+ex)^3}+\frac{-ae^2g+2adeh-3ad^2i}{2e^4(d+ex)^2}+\frac{-aeh+3adi}{e^4(d+ex)}$$

$$+bf\left(-\frac{c\sqrt{1+\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}}\sqrt{1+\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex}}\,\mathrm{AppellF1}\left(3,\frac{1}{2},\frac{1}{2},4,-\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex},-\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{9e^2(d+ex)^2\sqrt{1-c^2x^2}}\right.$$

$$\left.-\frac{\arcsin(cx)}{3e(d+ex)^3}\right)+\frac{ai\log(d+ex)}{e^4}+bh\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^3}\right.$$

$$-\frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{e^2}$$

$$+\frac{d^2\left(\frac{\sqrt{1-c^2x^2}(-ce^2+c^3d(4d+3ex))}{(-c^2d^2+e^2)^2(d+ex)^2}-\frac{2\arcsin(cx)}{e(d+ex)^3}+\frac{c^3(2c^2d^2+e^2)\log(d+ex)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}-\frac{c^3(2c^2d^2+e^2)\log\left(e+c^2dx+\sqrt{-c^2d^2+e^2}\sqrt{1-c\right.}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}}{6e^2}$$

$$+bg\left(\frac{\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}}{2e}\right.$$

$$-\frac{d\left(\frac{\sqrt{1-c^2x^2}(-ce^2+c^3d(4d+3ex))}{(-c^2d^2+e^2)^2(d+ex)^2}-\frac{2\arcsin(cx)}{e(d+ex)^3}+\frac{c^3(2c^2d^2+e^2)\log(d+ex)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}-\frac{c^3(2c^2d^2+e^2)\log\left(e+c^2dx+\sqrt{-c^2d^2+e^2}\sqrt{1-c\right.}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}}{6e}$$

$$+bi\left(-\frac{3d\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^4}\right.$$

$$3d^2\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{\cdots}\right)$$

[In] Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]

[Out] (-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(3*e^4*(d + e*x)^3) + (-(a*e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(2*e^4*(d + e*x)^2) + (-(a*e*h) + 3*a*d*i)/(e^4*(d + e*x)) + b*f*(-1/9*(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*Sqrt[1 + (-d + Sqrt[c^(-2)]*e)/(d + e*x)]*AppellF1[3, 1/2, 1/2, 4, -((-d + Sqrt[c^(-2)]*e)/(d + e*x)), -((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d + e*x)^2*Sqrt[1 - c^2*x^2]) - ArcSin[c*x]/(3*e*(d + e*x)^3)) + (a*i*Log[d + e*x])/e^4 + b*h*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^3 - (d*((c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2])))/e^2 + (d^2*((Sqrt[1 - c^2*x^2]*(-(c*e^2) + c^3*d*(4*d + 3*e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*ArcSin[c*x])/(e*(d + e*x)^3) + (c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2])))/(6*e^2)) + b*g*(((c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2]))/(2*e) - (d*((Sqrt[1 - c^2*x^2]*(-(c*e^2) + c^3*d*(4*d + 3*e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*ArcSin[c*x])/(e*(d + e*x)^3) + (c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2])))/(6*e)) + b*i*((-3*d*(-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]))/e^4 + (3*d^2*((c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2])))/(2*e^3) - (d^3*((Sqrt[1 - c^2*x^2]*(-(c*e^2) + c^3*d*(4*d + 3*e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*ArcSin[c*x])/(e*(d + e*x)^3) + (c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2])))/(6*e^3) + (((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, ((-I)*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e)/e^3)

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3756 vs. 2(1225) = 2450.

Time = 11.16 (sec) , antiderivative size = 3757, normalized size of antiderivative = 2.94

method	result	size
parts	Expression too large to display	3757
derivativedivides	Expression too large to display	3777
default	Expression too large to display	3777

```
[In] int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE
)
```

```
[Out] a*(i/e^4*ln(e*x+d)-(-3*d*i+e*h)/e^4/(e*x+d)-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^3
*f)/e^4/(e*x+d)^3-1/2*(3*d^2*i-2*d*e*h+e^2*g)/e^4/(e*x+d)^2)+b/c*(-I/e^4/(c
^2*d^2-e^2)^3*c^7*i*d^6*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2
+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+2*I/e^2/(c^2*d^2-e^2)^2*c^3*i*d^
2*arcsin(c*x)^2-I/e^4/(c^2*d^2-e^2)^2*c^5*i*d^4*arcsin(c*x)^2+3*I/e^2/(c^2*
d^2-e^2)^3*c^5*i*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*i*d^6*arc
sin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*
c-(-c^2*d^2+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*i*d^6*arcsin(c*x)*ln((I*
d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2
)^(1/2)))-3/e^2/(c^2*d^2-e^2)^3*c^5*i*d^4*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-3/e^2
/(c^2*d^2-e^2)^3*c^5*i*d^4*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+3*I/e^2/(c^2*d^2-e^2
)^3*c^5*i*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2
))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+3/(c^2*d^2-e^2)^3*c^3*i*arcsin(c*x)*ln((I*
d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2
)^(1/2)))*d^2+I*e^2/(c^2*d^2-e^2)^3*c*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*e^2/(c^2*d^2-e
^2)^3*c*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(
I*d*c-(-c^2*d^2+e^2)^(1/2)))+3/(c^2*d^2-e^2)^3*c^3*i*arcsin(c*x)*ln((I*d*c+
(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1
/2)))*d^2-3*I/(c^2*d^2-e^2)^3*c^3*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+2/3/e^3/(c^2*d^2
-e^2)^(5/2)*c^6*d^4*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(
c^2*d^2-e^2)^(1/2))+26/3/e^2/(c^2*d^2-e^2)^(5/2)*c^4*d^3*i*arctan(1/2*(2*(I
*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-5/3/e/(c^2*d^2-e^2
)^(5/2)*c^4*d^2*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*
d^2-e^2)^(1/2))+2/3/e/(c^2*d^2-e^2)^(5/2)*c^6*d^2*f*arctan(1/2*(2*(I*c*x+(-
c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-11/3/e^4/(c^2*d^2-e^2)^(5
/2)*c^6*d^5*i*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-
```

e^2)^(1/2))+1/3/e^2/(c^2*d^2-e^2)^(5/2)*c^6*d^3*g*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-e^2/(c^2*d^2-e^2)^3*c*i*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-e^2/(c^2*d^2-e^2)^3*c*i*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/2*I*c*i*arcsin(c*x)^2/e^4+1/3*e/(c^2*d^2-e^2)^(5/2)*c^4*f*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+2*e/(c^2*d^2-e^2)^(5/2)*c^2*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-6/(c^2*d^2-e^2)^(5/2)*c^2*d*i*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-4/3/(c^2*d^2-e^2)^(5/2)*c^4*d*g*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-I/(c^2*d^2-e^2)^2*c*i*arcsin(c*x)^2-3*I/(c^2*d^2-e^2)^3*c^3*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+1/6*c^2*(-3*arcsin(c*x)*c^2*e^7*g*x+18*arcsin(c*x)*d*e^6*i*c^2*x^2-(-c^2*x^2+1)^(1/2)*c^3*e^7*f*x-3*(-c^2*x^2+1)^(1/2)*c^3*e^7*g*x^2+3*I*c^4*e^7*g*x^3-18*I*c^4*d^3*e^4*h*x+9*I*c^4*d^2*e^5*g*x+27*I*c^4*d^3*e^4*i*x^2-18*I*c^4*d^2*e^5*h*x^2+9*I*c^4*d*e^6*g*x^2+9*I*c^4*d^2*e^5*i*x^3-6*I*c^4*d*e^6*h*x^3-36*arcsin(c*x)*c^4*d^3*e^4*i*x^2+12*arcsin(c*x)*c^4*d^2*e^5*h*x^2+27*arcsin(c*x)*c^6*d^6*e*i*x-6*arcsin(c*x)*c^6*d^5*e^2*h*x-3*arcsin(c*x)*c^6*d^4*e^3*g*x+18*arcsin(c*x)*c^6*d^5*e^2*i*x^2-6*arcsin(c*x)*c^6*d^4*e^3*h*x^2+27*arcsin(c*x)*c^2*d^2*e^5*i*x-6*arcsin(c*x)*c^2*d*e^6*h*x-54*arcsin(c*x)*c^4*d^4*e^3*i*x+12*arcsin(c*x)*c^4*d^3*e^4*h*x+6*arcsin(c*x)*c^4*d^2*e^5*g*x+11*(-c^2*x^2+1)^(1/2)*c^5*d^5*e^2*i*x-5*(-c^2*x^2+1)^(1/2)*c^5*d^4*e^3*h*x-(-c^2*x^2+1)^(1/2)*c^5*d^3*e^4*g*x+11*c^6*d^7*i*arcsin(c*x)-2*e^7*c^2*f*arcsin(c*x)-6*I*c^6*d^7*i+7*(-c^2*x^2+1)^(1/2)*c^5*d^2*e^5*f*x+6*(-c^2*x^2+1)^(1/2)*c^5*d^4*e^3*i*x^2-3*(-c^2*x^2+1)^(1/2)*c^5*d^3*e^4*h*x^2+3*(-c^2*x^2+1)^(1/2)*c^5*d*e^6*f*x^2-17*(-c^2*x^2+1)^(1/2)*c^3*d^3*e^4*i*x+11*(-c^2*x^2+1)^(1/2)*c^3*d^2*e^5*h*x-5*(-c^2*x^2+1)^(1/2)*c^3*d*e^6*g*x-9*(-c^2*x^2+1)^(1/2)*c^3*d^2*e^5*i*x^2+6*(-c^2*x^2+1)^(1/2)*c^3*d*e^6*h*x^2-18*I*c^6*d^6*e*i*x+9*I*c^6*d^5*e^2*h*x-9*I*c^6*d^3*e^4*f*x-18*I*c^6*d^5*e^2*i*x^2+9*I*c^6*d^4*e^3*h*x^2-9*I*c^6*d^2*e^5*f*x^2-6*I*c^6*d^4*e^3*i*x^3+3*I*c^6*d^3*e^4*h*x^3-3*I*c^6*d*e^6*f*x^3+27*I*c^4*d^4*e^3*i*x+9*I*c^4*d^5*e^2*i-6*I*c^4*d^4*e^3*h+3*I*c^4*d^3*e^4*g-6*arcsin(c*x)*e^7*h*c^2*x^2-8*(-c^2*x^2+1)^(1/2)*c^3*d^4*e^3*i+5*(-c^2*x^2+1)^(1/2)*c^3*d^3*e^4*h-2*(-c^2*x^2+1)^(1/2)*c^3*d^2*e^5*g-(-c^2*x^2+1)^(1/2)*c^3*d*e^6*f+5*(-c^2*x^2+1)^(1/2)*c^5*d^6*e*i-2*(-c^2*x^2+1)^(1/2)*c^5*d^5*e^2*h-(-c^2*x^2+1)^(1/2)*c^5*d^4*e^3*g+4*(-c^2*x^2+1)^(1/2)*c^5*d^3*e^4*f+3*I*c^6*d^6*e*h-3*I*c^6*d^4*e^3*f-2*e^5*c^2*d^2*h*arcsin(c*x)-e^2*c^6*d^5*g*arcsin(c*x)-2*e*c^6*d^6*h*arcsin(c*x)+2*e^4*c^4*d^3*g*arcsin(c*x)-e^6*c^2*g*arcsin(c*x)*d+4*e^5*c^4*d^2*f*arcsin(c*x)-22*e^2*c^4*d^5*i*arcsin(c*x)+4*e^3*c^4*d^4*h*arcsin(c*x)+11*e^4*c^2*d^3*i*arcsin(c*x)-2*e^3*c^6*d^4*f*arcsin(c*x))/(c*e*x+c*d)^3/(c^2*d^2-e^2)^2/e^4-I/e^4/(c^2*d^2-e^2)^3*c^7*i*d^6*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))))

Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b \arcsin(cx))}{(d + ex)^4} dx = \int \frac{(ix^3 + hx^2 + gx + f)(b \arcsin(cx) + a)}{(ex + d)^4} dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fri
cas")
```

```
[Out] integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b*
f)*arcsin(c*x))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4),
x)
```

Sympy [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b \arcsin(cx))}{(d + ex)^4} dx = \int \frac{(a + b \operatorname{asin}(cx))(f + gx + hx^2 + ix^3)}{(d + ex)^4} dx$$

```
[In] integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

```
[Out] Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b \arcsin(cx))}{(d + ex)^4} dx = \int \frac{(ix^3 + hx^2 + gx + f)(b \arcsin(cx) + a)}{(ex + d)^4} dx$$

```
[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="max
ima")
```

```
[Out] 1/6*a*i*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^
2*e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) - 1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3
*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*h/(
e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d*e^3
*x^2 + 3*d^2*e^2*x + d^3*e) + integrate((b*i*x^3 + b*h*x^2 + b*g*x + b*f)*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^
2*x^2 + 4*d^3*e*x + d^4), x)
```

Giac [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^4} dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^4} dx$$

[In] integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="gia
c")

[Out] integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^4} dx = \int \frac{(a + b\,\mathrm{asin}(c\,x))\,(i\,x^3 + h\,x^2 + g\,x + f)}{(d + e\,x)^4} dx$$

[In] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4,x)

[Out] int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4, x)

3.113 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 935

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e(c^2d^2-e^2)(d+ex)}+\frac{abg^2\arcsin(cx)}{e^2(ef-dg)}+\frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e(c^2d^2-e^2)(d+ex)}+\frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2}-\frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}-\frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}+\frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}-\frac{b^2c^2(ef-dg)\log(d+ex)}{e^2(c^2d^2-e^2)}-\frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}+\frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}$$

```
[Out] a*b*g^2*arcsin(c*x)/e^2/(-d*g+e*f)+1/2*b^2*g^2*arcsin(c*x)^2/e^2/(-d*g+e*f)
-1/2*(g*x+f)^2*(a+b*arcsin(c*x))^2/(-d*g+e*f)/(e*x+d)^2-a*b*c*(2*e^2*g-c^2*
d*(d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2
/(c^2*d^2-e^2)^(3/2)-b^2*c^2*(-d*g+e*f)*ln(e*x+d)/e^2/(c^2*d^2-e^2)-I*b^2*c
^3*d*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d
```

```
^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)+I*b^2*c^3*d*(-d*g+e*f)*arcsin(c*x)*
ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2
-e^2)^(3/2)-b^2*c^3*d*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(
c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)+b^2*c^3*d*(-d*g+e*f)*poly
log(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^
2-e^2)^(3/2)-2*I*b^2*c*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*I*b^2*c*g*arcsin(c*x)*ln
(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e
^2)^(1/2)-2*b^2*c*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-
e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*b^2*c*g*polylog(2,I*e*(I*c*x+(-c^2*x
^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+a*b*c*(-d*g
+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)+b^2*c*(-d*g+e*f)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)
```

Rubi [A] (verified)

Time = 1.85 (sec) , antiderivative size = 935, normalized size of antiderivative = 1.00, number of steps used = 33, number of rules used = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.870$, Rules used = {37, 4839, 12, 1665, 858, 222, 739, 210, 4883, 4881, 4737, 4857, 3405, 3404, 2296,

2221, 2317, 2438, 2747, 31}

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = -\frac{ib^2d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^2\left(c^2d^2-e^2\right)^{3/2}} + \frac{ib^2d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{b^2d(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^2\left(c^2d^2-e^2\right)^{3/2}} + \frac{b^2d(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{b^2(ef-dg)\log(d+ex)c^2}{e^2\left(c^2d^2-e^2\right)} + \frac{b^2(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)c}{e\left(c^2d^2-e^2\right)(d+ex)} - \frac{ab(2e^2g-c^2d(ef+dg))\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)c}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{2ib^2g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^2\sqrt{c^2d^2-e^2}} + \frac{2ib^2g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^2\sqrt{c^2d^2-e^2}} - \frac{2b^2g\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^2\sqrt{c^2d^2-e^2}} + \frac{2b^2g\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^2\sqrt{c^2d^2-e^2}} + \frac{ab(ef-dg)\sqrt{1-c^2x^2}c}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)}$$

```
[In] Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

```
[Out] (a*b*c*(e*f - d*g)*Sqrt[1 - c^2*x^2])/(e*(c^2*d^2 - e^2)*(d + e*x)) + (a*b*
g^2*ArcSin[c*x])/(e^2*(e*f - d*g)) + (b^2*c*(e*f - d*g)*Sqrt[1 - c^2*x^2]*A
rcSin[c*x])/(e*(c^2*d^2 - e^2)*(d + e*x)) + (b^2*g^2*ArcSin[c*x]^2)/(2*e^2*
(e*f - d*g)) - ((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(2*(e*f - d*g)*(d + e*x)
^2) - (a*b*c*(2*e^2*g - c^2*d*(e*f + d*g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d
```

```
^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) - ((2*I)*b^2*c*g
*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/
(e^2*Sqrt[c^2*d^2 - e^2]) - (I*b^2*c^3*d*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I
*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3
/2)) + ((2*I)*b^2*c*g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + (I*b^2*c^3*d*(e*f - d*g)*A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e
^2*(c^2*d^2 - e^2)^(3/2)) - (b^2*c^2*(e*f - d*g)*Log[d + e*x])/(e^2*(c^2*d^
2 - e^2)) - (2*b^2*c*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d
^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (b^2*c^3*d*(e*f - d*g)*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^
(3/2)) + (2*b^2*c*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2
- e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + (b^2*c^3*d*(e*f - d*g)*PolyLog[2, (I*
e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3/
2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
```

```
[{a, c, d, e}, x]
```

Rule 858

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1665

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Q = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
d + e*x, x]}, Simp[(e*R*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*
d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)
*(a + c*x^2)^p*ExpandToSum[(m + 1)*(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*
R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, c, d, e, p}, x] && PolyQ[Pq, x]
 && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4839

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*n, Int[SimplifyIntegra
nd[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; FreeQ[
{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && LtQ[
m + p + 1, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rubi steps

$$\text{integral} = -\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} - (2bc)\int -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(bc)\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{ef-dg}$$

$$= -\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(bc)\int \left(\frac{a(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}} + \frac{b(f+gx)^2\arcsin(cx)}{(d+ex)^2\sqrt{1-c^2x^2}}\right)dx}{ef-dg}$$

$$= -\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(abc)\int \frac{(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{ef-dg} + \frac{(b^2c)\int \frac{(f+gx)^2\arcsin(cx)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{ef-dg}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(b^2c)\int \left(\frac{g^2\arcsin(cx)}{e^2\sqrt{1-c^2x^2}} + \frac{(ef-dg)^2\arcsin(cx)}{e^2(d+ex)^2\sqrt{1-c^2x^2}} + \frac{2g(ef-dg)\arcsin(cx)}{e^2(d+ex)\sqrt{1-c^2x^2}}\right)dx}{ef-dg} + \frac{(abc)\int \frac{c^2df^2-g(2ef-dg)+\left(\frac{c^2d^2}{e}-e\right)g^2x}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{\left(c^2d^2-e^2\right)(ef-dg)}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(2b^2cg)\int \frac{\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2} + \frac{(abcg^2)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{e^2(ef-dg)} + \frac{(b^2cg^2)\int \frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{e^2(ef-dg)} + \frac{(b^2c(ef-dg))\int \frac{\arcsin(cx)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{e^2} - \frac{(abc(2e^2g-c^2d(ef+dg)))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2\left(c^2d^2-e^2\right)}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} + \frac{(2b^2cg)\operatorname{Subst}\left(\int \frac{x}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(b^2c^2(ef-dg))\operatorname{Subst}\left(\int \frac{x}{(cd+e\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(abc(2e^2g-c^2d(ef+dg)))\operatorname{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^2\left(c^2d^2-e^2\right)}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} - \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} + \frac{(4b^2cg)\operatorname{Subst}\left(\int \frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(b^2c^3d(ef-dg))\operatorname{Subst}\left(\int \frac{x}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2\left(c^2d^2-e^2\right)} - \frac{(b^2c^2(ef-dg))\operatorname{Subst}\left(\int \frac{\cos(x)}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e\left(c^2d^2-e^2\right)}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} - \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{(4ib^2cg)\operatorname{Subst}\left(\int \frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx, x, \arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}} + \frac{(4ib^2cg)\operatorname{Subst}\left(\int \frac{e^{ix}x}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx, x, \arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}} - \frac{(b^2c^2(ef-dg))\operatorname{Subst}\left(\int \frac{1}{cd+x}\,dx, x, cex\right)}{e^2\left(c^2d^2-e^2\right)} + \frac{(2b^2c^3d(ef-dg))\operatorname{Subst}\left(\int \frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}\,dx, x, \arcsin(cx)\right)}{e^2\left(c^2d^2-e^2\right)}$$

$$
\begin{aligned}
&= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e(c^2d^2-e^2)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e(c^2d^2-e^2)(d+ex)} \\
&+ \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} \\
&- \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} \\
&- \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&+ \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{b^2c^2(ef-dg)\log(d+ex)}{e^2(c^2d^2-e^2)} \\
&+ \frac{(2ib^2cg)\,\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&- \frac{(2ib^2cg)\,\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&- \frac{(2ib^2c^3d(ef-dg))\,\text{Subst}\left(\int\frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}dx,x,\arcsin(cx)\right)}{e(c^2d^2-e^2)^{3/2}} \\
&+ \frac{(2ib^2c^3d(ef-dg))\,\text{Subst}\left(\int\frac{e^{ix}x}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}dx,x,\arcsin(cx)\right)}{e(c^2d^2-e^2)^{3/2}}
\end{aligned}
$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e(c^2d^2-e^2)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2}$$
$$- \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}$$
$$- \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$- \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+ \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2(ef-dg)\log(d+ex)}{e^2(c^2d^2-e^2)}$$
$$+ \frac{(2b^2cg)\,\text{Subst}\left(\int \frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$- \frac{(2b^2cg)\,\text{Subst}\left(\int \frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+ \frac{(ib^2c^3d(ef-dg))\,\text{Subst}\left(\int \log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^2(c^2d^2-e^2)^{3/2}}$$
$$- \frac{(ib^2c^3d(ef-dg))\,\text{Subst}\left(\int \log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^2(c^2d^2-e^2)^{3/2}}$$

$$= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e\left(c^2d^2-e^2\right)(d+ex)}$$
$$+ \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2}$$
$$- \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}$$
$$- \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$- \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}$$
$$+ \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+ \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{b^2c^2(ef-dg)\log(d+ex)}{e^2\left(c^2d^2-e^2\right)}$$
$$- \frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+ \frac{(b^2c^3d(ef-dg))\,\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}$$
$$- \frac{(b^2c^3d(ef-dg))\,\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}$$

$$
\begin{aligned}
&= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\left(c^2d^2-e^2\right)(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e\left(c^2d^2-e^2\right)(d+ex)} \\
&+ \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} \\
&- \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} \\
&- \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&- \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} \\
&+ \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&+ \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} - \frac{b^2c^2(ef-dg)\log(d+ex)}{e^2\left(c^2d^2-e^2\right)} \\
&- \frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}} \\
&+ \frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.81 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.61

$$
\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx
$$

$$
= \frac{-\frac{(ef-dg)(a+b\arcsin(cx))^2}{(d+ex)^2} - \frac{2g(a+b\arcsin(cx))^2}{d+ex} + \frac{4bcg\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{Pol}}{\sqrt{c^2d^2-e^2}}}{}
$$

```
[In] Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

```
[Out] (-((((e*f - d*g)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2) - (2*g*(a + b*ArcSin[c*
x])^2)/(d + e*x) + (4*b*c*g*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*Ar
cSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*
d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqr
t[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2] + (2*b*c*(e*f - d*g)*(e*Sqrt[c^2*d
^2 - e^2]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - b*c*Sqrt[c^2*d^2 - e^2]*(
```

```
d + e*x)*Log[d + e*x] - I*c^2*d*(d + e*x)*((a + b*ArcSin[c*x])*(Log[1 + (I*
e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - I*b*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + I*b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])])))/((c^2*d^2 - e^2)^(3/2)*(d + e*x)))/(2*e^
2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2320 vs. 2(941) = 1882.

Time = 4.98 (sec) , antiderivative size = 2321, normalized size of antiderivative = 2.48

method	result	size
derivativedivides	Expression too large to display	2321
default	Expression too large to display	2321
parts	Expression too large to display	2336

```
[In] int((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2*c^2*(1/2*c*(d*g-e*f)/e^2/(c*e*x+c*d)^2-g/e^2/(c*e*x+c*d))+b^2*c^2*
(-1/2*arcsin(c*x)*(2*(-c^2*x^2+1)^(1/2)*c^2*d^2*e*g-2*(-c^2*x^2+1)^(1/2)*c^
2*d*e^2*f-2*(-c^2*x^2+1)^(1/2)*c^2*e^3*f*x+2*I*c^3*d^2*e*f+4*I*c^3*d*e^2*f*
x+2*arcsin(c*x)*c^3*d^2*e*g*x-2*I*c^3*d*e^2*g*x^2+2*I*c^3*e^3*f*x^2-2*arcsi
n(c*x)*e^3*g*c*x-4*I*c^3*d^2*e*g*x-e^2*c*d*g*arcsin(c*x)-2*I*c^3*d^3*g+2*(-
c^2*x^2+1)^(1/2)*c^2*d*e^2*g*x+c^3*d^3*g*arcsin(c*x)+e*c^3*d^2*f*arcsin(c*x
)-e^3*c*f*arcsin(c*x))/(c^2*d^2-e^2)/(c*e*x+c*d)^2/e^2+2/e/(c^2*d^2-e^2)*c*
f*ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/e/(c^2*d^2-e^2)*c*f*ln(I*e*(I*c*x+(-c^2*x^
2+1)^(1/2))^2-2*d*c*(I*c*x+(-c^2*x^2+1)^(1/2))-I*e)-2/e^2/(c^2*d^2-e^2)*c*d
*g*ln(I*c*x+(-c^2*x^2+1)^(1/2))+1/e^2/(c^2*d^2-e^2)*c*d*g*ln(I*e*(I*c*x+(-c
^2*x^2+1)^(1/2))^2-2*d*c*(I*c*x+(-c^2*x^2+1)^(1/2))-I*e)+2*(-c^2*d^2+e^2)^(
1/2)/(c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(
-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*(-c^2*d^2+e^2)^(1/2)/(
c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d
^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e*(-c^2*d^2+e^2)^(1/2)/(c^2*
d^2-e^2)^2*c^2*d*f*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)
^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2
)^2*g*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))-1/e^2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d^2
*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))
/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/e^2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c
^2*d^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^
(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I/e^2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^
2)^2*c^2*d^2*g*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/
```

```
2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*I*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*
g*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-
c^2*d^2+e^2)^(1/2)))-1/e*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d*f*arcsi
n(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-
(-c^2*d^2+e^2)^(1/2)))+1/e*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d*f*arc
sin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))-I/e^2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d^2
*g*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(
-c^2*d^2+e^2)^(1/2)))+I/e*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d*f*dilo
g((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^
2+e^2)^(1/2))))+2*a*b*c^2*(1/2*arcsin(c*x)*c/e^2/(c*e*x+c*d)^2*d*g-1/2*arcs
in(c*x)*c/e/(c*e*x+c*d)^2*f-arcsin(c*x)*g/e^2/(c*e*x+c*d)+1/2/e^2*(-2*g/e/(
-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-
(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/
e^2)^(1/2))/(c*x+d*c/e))-c*(d*g-e*f)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(
-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e
)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2
-e^2)/e^2)^(1/2))/(c*x+d*c/e)))))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
[Out] integral((a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c*x)^2 + 2*(a*b*g*x +
a*b*f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)}{(d+ex)^3}\,dx$$

```
[In] integrate((g*x+f)*(a+b*asin(c*x))**2/(e*x+d)**3,x)
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

```
[In] integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))^2}{(d+e\,x)^3}\,dx$$

```
[In] int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
```

```
[Out] int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

3.114 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 1678

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$
$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} + \frac{abc(ef-dg)^2\sqrt{1-c^2x^2}}{e^2(c^2d^2-e^2)(d+ex)} - \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2}$$
$$- \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)} + \frac{b^2c(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)}{e^2(c^2d^2-e^2)(d+ex)}$$
$$- \frac{iabg^2\arcsin(cx)^2}{e^3} - \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2} - \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)}$$
$$- \frac{ib^2g^2\arcsin(cx)^3}{3e^3} - \frac{abc(ef-dg)(4e^2g-c^2d(ef+3dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$- \frac{4ib^2cg(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$- \frac{ib^2c^3d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+ \frac{4ib^2cg(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$+ \frac{ib^2c^3d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{a^2g^2\log(d+ex)}{e^3} - \frac{b^2c^2(ef-dg)^2\log(d+ex)}{e^3(c^2d^2-e^2)}$$
$$- \frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{4b^2cg(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$- \frac{b^2c^3d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3(c^2d^2-e^2)^{3/2}} - \frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$- \frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{4b^2cg(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$+ \frac{b^2c^3d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3(c^2d^2-e^2)^{3/2}} - \frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+ \frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

```
[Out] b^2*c*(-d*g+e*f)^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)
-a*b*c*(-d*g+e*f)*(4*e^2*g-c^2*d*(3*d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e
^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)+a*b*c*(-d*g+e*f)^2*(-
c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)+I*b^2*c^3*d*(-d*g+e*f)^2*arcsin(
c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^
2*d^2-e^2)^(3/2)+4*I*b^2*c*g*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x
^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*b^2*g*(-d
*g+e*f)*arcsin(c*x)^2/e^3/(e*x+d)+2*a*b*g^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c
^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+2*a*b*g^2*arcsin(c*x)*ln(1-
I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*a*b*g^2*arc
sin(c*x)^2/e^3-2*I*a*b*g^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c
^2*d^2-e^2)^(1/2)))/e^3-2*I*b^2*g^2*arcsin(c*x)*polylog(2,I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-2*I*a*b*g^2*polylog(2,I*e*(I*c
*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-2*I*b^2*g^2*arcsin(c*
x)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-
a*b*(-d*g+e*f)^2*arcsin(c*x)/e^3/(e*x+d)^2+b^2*g^2*arcsin(c*x)^2*ln(1-I*e*(
I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b^2*g^2*arcsin(c*x
)^2*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-b^2*
c^2*(-d*g+e*f)^2*ln(e*x+d)/e^3/(c^2*d^2-e^2)-I*b^2*c^3*d*(-d*g+e*f)^2*arcsi
n(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(
c^2*d^2-e^2)^(3/2)-4*I*b^2*c*g*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2
*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*a^2*g*(
-d*g+e*f)/e^3/(e*x+d)-1/2*b^2*(-d*g+e*f)^2*arcsin(c*x)^2/e^3/(e*x+d)^2-1/3*
I*b^2*g^2*arcsin(c*x)^3/e^3+a^2*g^2*ln(e*x+d)/e^3+2*b^2*g^2*polylog(3,I*e*(
I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+2*b^2*g^2*polylog(
3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-1/2*a^2*(-d
*g+e*f)^2/e^3/(e*x+d)^2-b^2*c^3*d*(-d*g+e*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x
^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(3/2)+b^2*c^3*d*(
-d*g+e*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/
2)))/e^3/(c^2*d^2-e^2)^(3/2)-4*a*b*g*(-d*g+e*f)*arcsin(c*x)/e^3/(e*x+d)-4*b
^2*c*g*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^
2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)+4*b^2*c*g*(-d*g+e*f)*polylog(2,I*e*(I*c*
x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)
```

Rubi [A] (verified)

Time = 2.44 (sec) , antiderivative size = 1678, normalized size of antiderivative = 1.00, number of steps used = 55, number of rules used = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 1.000$, Rules used = {4843, 45, 4837, 12, 6874, 821, 739, 210, 222, 2451, 4825, 4615, 2221, 2317, 2438,

4827, 4857, 3405, 3404, 2296, 2747, 31, 2611, 2320, 6724}

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= -\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}$$
$$+\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}$$
$$-\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}+\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}$$
$$-\frac{b^2(ef-dg)^2\log(d+ex)c^2}{e^3\left(c^2d^2-e^2\right)}+\frac{b^2(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)c}{e^2\left(c^2d^2-e^2\right)(d+ex)}$$
$$-\frac{ab(ef-dg)\left(4e^2g-c^2d(ef+3dg)\right)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)c}{e^3\left(c^2d^2-e^2\right)^{3/2}}$$
$$-\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}$$
$$+\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}$$
$$-\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}$$
$$+\frac{ab(ef-dg)^2\sqrt{1-c^2x^2}c}{e^2\left(c^2d^2-e^2\right)(d+ex)}-\frac{ib^2g^2\arcsin(cx)^3}{3e^3}-\frac{iabg^2\arcsin(cx)^2}{e^3}$$
$$-\frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)}-\frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2}$$
$$-\frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}-\frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2}$$
$$+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+\frac{a^2g^2\log(d+ex)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2a^2g(ef-dg)}{e^3(d+ex)}-\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2}$$

```
[In] Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

```
[Out] -1/2*(a^2*(e*f - d*g)^2)/(e^3*(d + e*x)^2) - (2*a^2*g*(e*f - d*g))/(e^3*(d
+ e*x)) + (a*b*c*(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e^2*(c^2*d^2 - e^2)*(d +
 e*x)) - (a*b*(e*f - d*g)^2*ArcSin[c*x])/(e^3*(d + e*x)^2) - (4*a*b*g*(e*f
- d*g)*ArcSin[c*x])/(e^3*(d + e*x)) + (b^2*c*(e*f - d*g)^2*Sqrt[1 - c^2*x^2
]*ArcSin[c*x])/(e^2*(c^2*d^2 - e^2)*(d + e*x)) - (I*a*b*g^2*ArcSin[c*x]^2)/
e^3 - (b^2*(e*f - d*g)^2*ArcSin[c*x]^2)/(2*e^3*(d + e*x)^2) - (2*b^2*g*(e*f
 - d*g)*ArcSin[c*x]^2)/(e^3*(d + e*x)) - ((I/3)*b^2*g^2*ArcSin[c*x]^3)/e^3
- (a*b*c*(e*f - d*g)*(4*e^2*g - c^2*d*(e*f + 3*d*g))*ArcTan[(e + c^2*d*x)/(
Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (2*a
*b*g^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^
2])])/e^3 - ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) - (I*b^2*c^
3*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c
^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcSin[c*x]^2*Log[1
 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3 + (2*a*b*g^2*A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^
3 + ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) + (I*b^2*c^3*d*(e*f
 - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcSin[c*x]^2*Log[1 - (I*e*
E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3 + (a^2*g^2*Log[d + e*x
])/e^3 - (b^2*c^2*(e*f - d*g)^2*Log[d + e*x])/(e^3*(c^2*d^2 - e^2)) - ((2*I
)*a*b*g^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/
e^3 - (4*b^2*c*g*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt
[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) - (b^2*c^3*d*(e*f - d*g)^2*Pol
yLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2
 - e^2)^(3/2)) - ((2*I)*b^2*g^2*ArcSin[c*x]*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3 - ((2*I)*a*b*g^2*PolyLog[2, (I*e*E^(I
*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3 + (4*b^2*c*g*(e*f - d*g)*P
olyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c
^2*d^2 - e^2]) + (b^2*c^3*d*(e*f - d*g)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) - ((2*I)*b^2*g^
2*ArcSin[c*x]*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2]
)])/e^3 + (2*b^2*g^2*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
 - e^2])])/e^3 + (2*b^2*g^2*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[
c^2*d^2 - e^2])])/e^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
```

```
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
```

```
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 4843

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a^2(f+gx)^2}{(d+ex)^3} + \frac{2ab(f+gx)^2 \arcsin(cx)}{(d+ex)^3} + \frac{b^2(f+gx)^2 \arcsin(cx)^2}{(d+ex)^3} \right) dx \\
&= a^2 \int \frac{(f+gx)^2}{(d+ex)^3}\,dx + (2ab) \int \frac{(f+gx)^2 \arcsin(cx)}{(d+ex)^3}\,dx + b^2 \int \frac{(f+gx)^2 \arcsin(cx)^2}{(d+ex)^3}\,dx \\
&= -\frac{ab(ef-dg)^2 \arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)} \\
&\quad + \frac{2abg^2 \arcsin(cx)\log(d+ex)}{e^3} \\
&\quad + a^2 \int \left(\frac{(ef-dg)^2}{e^2(d+ex)^3} + \frac{2g(ef-dg)}{e^2(d+ex)^2} + \frac{g^2}{e^2(d+ex)} \right) dx \\
&\quad + b^2 \int \left(\frac{(ef-dg)^2 \arcsin(cx)^2}{e^2(d+ex)^3} + \frac{2g(ef-dg)\arcsin(cx)^2}{e^2(d+ex)^2} + \frac{g^2 \arcsin(cx)^2}{e^2(d+ex)} \right) dx \\
&\quad - (2abc) \int \frac{-((ef-dg)(3dg+e(f+4gx))) + 2g^2(d+ex)^2\log(d+ex)}{2e^3(d+ex)^2\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} - \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)} + \frac{a^2g^2\log(d+ex)}{e^3} + \frac{2abg^2\arcsin(cx)\log(d+ex)}{e^3} - \frac{(abc)\int \frac{-((ef-dg)(3dg+e(f+4gx)))+2g^2(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{(b^2g^2)\int \frac{\arcsin(cx)^2}{d+ex}\,dx}{e^2} + \frac{(2b^2g(ef-dg))\int \frac{\arcsin(cx)^2}{(d+ex)^2}\,dx}{e^2} + \frac{(b^2(ef-dg)^2)\int \frac{\arcsin(cx)^2}{(d+ex)^3}\,dx}{e^2}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} - \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)} - \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2} - \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)} + \frac{a^2g^2\log(d+ex)}{e^3} + \frac{2abg^2\arcsin(cx)\log(d+ex)}{e^3} - \frac{(abc)\int \left(-\frac{(ef-dg)(ef+3dg+4egx)}{(d+ex)^2\sqrt{1-c^2x^2}} + \frac{2g^2\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^3} + \frac{(b^2g^2)\,\text{Subst}\left(\int \frac{x^2\cos(x)}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(4b^2cg(ef-dg))\int \frac{\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{(b^2c(ef-dg)^2)\int \frac{\arcsin(cx)}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{e^3}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} - \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)} - \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2} - \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)} - \frac{ib^2g^2\arcsin(cx)^3}{3e^3} + \frac{a^2g^2\log(d+ex)}{e^3} + \frac{2abg^2\arcsin(cx)\log(d+ex)}{e^3} - \frac{(2abcg^2)\int \frac{\log(d+ex)}{\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{(b^2g^2)\,\text{Subst}\left(\int \frac{e^{ix}x^2}{cd-\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(b^2g^2)\,\text{Subst}\left(\int \frac{e^{ix}x^2}{cd+\sqrt{c^2d^2-e^2}-iee^{ix}}\,dx, x, \arcsin(cx)\right)}{e^2} + \frac{(abc(ef-dg))\int \frac{ef+3dg+4egx}{(d+ex)^2\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{(4b^2cg(ef-dg))\,\text{Subst}\left(\int \frac{x}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^3} + \frac{(b^2c^2(ef-dg)^2)\,\text{Subst}\left(\int \frac{x}{(cd+e\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{e^3}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} + \frac{abc(ef-dg)^2\sqrt{1-c^2x^2}}{e^2(c^2d^2-e^2)(d+ex)}$$
$$- \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}$$
$$+ \frac{b^2c(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)}{e^2(c^2d^2-e^2)(d+ex)} - \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2}$$
$$- \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)} - \frac{ib^2g^2\arcsin(cx)^3}{3e^3}$$
$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+ \frac{a^2g^2\log(d+ex)}{e^3} - \frac{(2b^2g^2)\operatorname{Subst}\left(\int x\log\left(1-\frac{iee^{ix}}{cd-\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^3}$$
$$- \frac{(2b^2g^2)\operatorname{Subst}\left(\int x\log\left(1-\frac{iee^{ix}}{cd+\sqrt{c^2d^2-e^2}}\right)dx, x, \arcsin(cx)\right)}{e^3}$$
$$+ \frac{(2abcg^2)\int\frac{\arcsin(cx)}{cd+cex}dx}{e^2}$$
$$+ \frac{(8b^2cg(ef-dg))\operatorname{Subst}\left(\int\frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}dx, x, \arcsin(cx)\right)}{e^3}$$
$$+ \frac{(b^2c^3d(ef-dg)^2)\operatorname{Subst}\left(\int\frac{x}{cd+e\sin(x)}dx, x, \arcsin(cx)\right)}{e^3(c^2d^2-e^2)}$$
$$- \frac{(b^2c^2(ef-dg)^2)\operatorname{Subst}\left(\int\frac{\cos(x)}{cd+e\sin(x)}dx, x, \arcsin(cx)\right)}{e^2(c^2d^2-e^2)}$$
$$- \frac{(abc(ef-dg)(4e^2g-c^2d(ef+3dg)))\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^3(c^2d^2-e^2)}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} + \frac{abc(ef-dg)^2\sqrt{1-c^2x^2}}{e^2\left(c^2d^2-e^2\right)(d+ex)}$$
$$- \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}$$
$$+ \frac{b^2c(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)}{e^2\left(c^2d^2-e^2\right)(d+ex)} - \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2}$$
$$- \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)} - \frac{ib^2g^2\arcsin(cx)^3}{3e^3}$$
$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+ \frac{a^2g^2\log(d+ex)}{e^3} - \frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$- \frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$
$$+ \frac{(2ib^2g^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{iee^{ix}}{cd-\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^3}$$
$$+ \frac{(2ib^2g^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{iee^{ix}}{cd+\sqrt{c^2d^2-e^2}}\right)dx,x,\arcsin(cx)\right)}{e^3}$$
$$+ \frac{(2abcg^2)\operatorname{Subst}\left(\int\frac{x\cos(x)}{c^2d+ce\sin(x)}dx,x,\arcsin(cx)\right)}{e^2}$$
$$- \frac{(8ib^2cg(ef-dg))\operatorname{Subst}\left(\int\frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+ \frac{(8ib^2cg(ef-dg))\operatorname{Subst}\left(\int\frac{e^{ix}x}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$- \frac{(b^2c^2(ef-dg)^2)\operatorname{Subst}\left(\int\frac{1}{cd+x}dx,x,cex\right)}{e^3\left(c^2d^2-e^2\right)}$$
$$+ \frac{(2b^2c^3d(ef-dg)^2)\operatorname{Subst}\left(\int\frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}dx,x,\arcsin(cx)\right)}{e^3\left(c^2d^2-e^2\right)}$$
$$+ \frac{(abc(ef-dg)\left(4e^2g-c^2d(ef+3dg)\right))\operatorname{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^3\left(c^2d^2-e^2\right)}$$

$$= -\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2} - \frac{2a^2g(ef-dg)}{e^3(d+ex)} + \frac{abc(ef-dg)^2\sqrt{1-c^2x^2}}{e^2\left(c^2d^2-e^2\right)(d+ex)}$$

$$- \frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2} - \frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}$$

$$+ \frac{b^2c(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)}{e^2\left(c^2d^2-e^2\right)(d+ex)} - \frac{iabg^2\arcsin(cx)^2}{e^3}$$

$$- \frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2} - \frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)} - \frac{ib^2g^2\arcsin(cx)^3}{3e^3}$$

$$- \frac{abc(ef-dg)\left(4e^2g-c^2d(ef+3dg)\right)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\left(c^2d^2-e^2\right)^{3/2}}$$

$$- \frac{4ib^2cg(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$

$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

$$+ \frac{4ib^2cg(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$

$$+ \frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{a^2g^2\log(d+ex)}{e^3}$$

$$- \frac{b^2c^2(ef-dg)^2\log(d+ex)}{e^3\left(c^2d^2-e^2\right)} - \frac{2ib^2g^2\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

$$- \frac{2ib^2g^2\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}$$

$$+ \frac{(2b^2g^2)\,\mathrm{Subst}\left(\int\frac{\mathrm{PolyLog}\left(2,\frac{iex}{cd-\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^3}$$

$$+ \frac{(2b^2g^2)\,\mathrm{Subst}\left(\int\frac{\mathrm{PolyLog}\left(2,\frac{iex}{cd+\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^3}$$

$$+ \frac{(2abcg^2)\,\mathrm{Subst}\left(\int\frac{e^{ix}x}{c^2d-c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$

$$+ \frac{(2abcg^2)\,\mathrm{Subst}\left(\int\frac{e^{ix}x}{c^2d+c\sqrt{c^2d^2-e^2}-icee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$

$$+ \frac{(4ib^2cg(ef-dg))\,\mathrm{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3\sqrt{c^2d^2-e^2}}$$

$$- \frac{(4ib^2cg(ef-dg))\,\mathrm{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3\sqrt{c^2d^2-e^2}}$$

$$- \frac{(2ib^2c^3d(ef-dg)^2)\,\mathrm{Subst}\left(\int\frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2\left(c^2d^2-e^2\right)^{3/2}}$$

$$(2ib^2c^3d(ef-dg)^2)\,\mathrm{Subst}\left(\int \frac{e^{ix}x}{\ldots}\,dx,x,\arcsin(cx)\right)$$

= Too large to display

Mathematica [A] (verified)

Time = 4.54 (sec) , antiderivative size = 903, normalized size of antiderivative = 0.54

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{-\frac{3(ef-dg)^2(a+b\arcsin(cx))^2}{(d+ex)^2}+\frac{12g(-ef+dg)(a+b\arcsin(cx))^2}{d+ex}-\frac{2ig^2(a+b\arcsin(cx))^3}{b}+6g^2(a+b\arcsin(cx))^2\log\left(1+\frac{iee}{-cd}\right.}{}$$

```
[In] Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

```
[Out] ((-3*(e*f - d*g)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2 + (12*g*(-(e*f) + d*g
)*(a + b*ArcSin[c*x])^2)/(d + e*x) - ((2*I)*g^2*(a + b*ArcSin[c*x])^3)/b +
6*g^2*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[
c^2*d^2 - e^2])] + 6*g^2*(a + b*ArcSin[c*x])^2*Log[1 - (I*e*E^(I*ArcSin[c*x
]))/(c*d + Sqrt[c^2*d^2 - e^2])] + (24*b*c*g*(-(e*f) + d*g)*(I*(a + b*ArcSi
n[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] -
Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) + b*PolyLog[2
, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - b*PolyLog[2, (I*e*
E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2] + (6*
b*c^2*(e*f - d*g)^2*((e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*d + c*e*x
) - b*Log[d + e*x] + (c*d*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcS
in[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))
/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
- Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[
c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2]))/(c^2*d^2 - e^2) - 12*b*g^2*(I*(a +
 b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^
2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]) -
 12*b*g^2*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^
2*d^2 - e^2])])))/(6*e^3)
```

Maple [F]

$$\int \frac{(gx+f)^2\,(a+b\arcsin(cx))^2}{(ex+d)^3}dx$$

```
[In] int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

```
[Out] int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
[Out] integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
+ b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin(c
*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^2}{(d+ex)^3}\,dx$$

```
[In] integrate((g*x+f)**2*(a+b*asin(c*x))**2/(e*x+d)**3,x)
[Out] Integral((a + b*asin(c*x))**2*(f + g*x)**2/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

```
[In] integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
[Out] integrate((g*x + f)^2*(b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{{\left(f+g\,x\right)}^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d+e\,x\right)}^3}\,dx$$

```
[In] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
[Out] int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

3.115 $\int (g+hx)^3 (d+ex+fx^2) (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 28, antiderivative size = 1016

$$
\begin{aligned}
&\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx\\
&= -2b^2dg^3x-\frac{16b^2h^2(3fg+eh)x}{75c^4}-\frac{4b^2g(fg^2+3h(eg+dh))\,x}{9c^2}\\
&-\frac{5b^2fh^3x^2}{96c^4}-\frac{1}{4}b^2g^2(eg+3dh)x^2-\frac{3b^2h(3fg^2+h(3eg+dh))\,x^2}{32c^2}\\
&-\frac{8b^2h^2(3fg+eh)x^3}{225c^2}-\frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3-\frac{5b^2fh^3x^4}{288c^2}\\
&-\frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4-\frac{2}{125}b^2h^2(3fg+eh)x^5-\frac{1}{108}b^2fh^3x^6\\
&+\frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}\\
&+\frac{4bg(fg^2+3h(eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}\\
&+\frac{5bfh^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c^5}+\frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\
&+\frac{3bh(3fg^2+h(3eg+dh))\,x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}\\
&+\frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}\\
&+\frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}\\
&+\frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3}\\
&+\frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\
&+\frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}+\frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c}\\
&-\frac{5fh^3(a+b\arcsin(cx))^2}{96c^6}-\frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2}\\
&-\frac{3h(3fg^2+h(3eg+dh))\,(a+b\arcsin(cx))^2}{32c^4}+dg^3x(a+b\arcsin(cx))^2\\
&+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2\\
&+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2\\
&+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2
\end{aligned}
$$

```
[Out] 2*b*d*g^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+16/75*b*h^2*(e*h+3*f*g)*(a
+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+4/9*b*g*(f*g^2+3*h*(d*h+e*g))*(a+b*a
```

```
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3-16/75*b^2*h^2*(e*h+3*f*g)*x/c^4-4/9*b^2*
g*(f*g^2+3*h*(d*h+e*g))*x/c^2-5/96*b^2*f*h^3*x^2/c^4-3/32*b^2*h*(3*f*g^2+h*
(d*h+3*e*g))*x^2/c^2-8/225*b^2*h^2*(e*h+3*f*g)*x^3/c^2-5/288*b^2*f*h^3*x^4/
c^2+d*g^3*x*(a+b*arcsin(c*x))^2-2*b^2*d*g^3*x-1/4*b^2*g^2*(3*d*h+e*g)*x^2-2
/27*b^2*g*(f*g^2+3*h*(d*h+e*g))*x^3-1/32*b^2*h*(3*f*g^2+h*(d*h+3*e*g))*x^4-
2/125*b^2*h^2*(e*h+3*f*g)*x^5-1/108*b^2*f*h^3*x^6-5/96*f*h^3*(a+b*arcsin(c*
x))^2/c^6-1/4*g^2*(3*d*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32*h*(3*f*g^2+h*(d*
h+3*e*g))*(a+b*arcsin(c*x))^2/c^4+1/2*g^2*(3*d*h+e*g)*x^2*(a+b*arcsin(c*x))
^2+1/3*g*(f*g^2+3*h*(d*h+e*g))*x^3*(a+b*arcsin(c*x))^2+1/4*h*(3*f*g^2+h*(d*
h+3*e*g))*x^4*(a+b*arcsin(c*x))^2+1/5*h^2*(e*h+3*f*g)*x^5*(a+b*arcsin(c*x))
^2+1/6*f*h^3*x^6*(a+b*arcsin(c*x))^2+5/72*b*f*h^3*x^3*(a+b*arcsin(c*x))*(-c
^2*x^2+1)^(1/2)/c^3+1/8*b*h*(3*f*g^2+h*(d*h+3*e*g))*x^3*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/c+2/25*b*h^2*(e*h+3*f*g)*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/c+1/18*b*f*h^3*x^5*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+5/48*b*f
*h^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+1/2*b*g^2*(3*d*h+e*g)*x*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+3/16*b*h*(3*f*g^2+h*(d*h+3*e*g))*x*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+8/75*b*h^2*(e*h+3*f*g)*x^2*(a+b*arcsin
(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/9*b*g*(f*g^2+3*h*(d*h+e*g))*x^2*(a+b*arcsin
(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 1.03 (sec) , antiderivative size = 1016, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{4835, 4715, 4767, 8, 4723, 4795, 4737, 30\}$

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx$$

$$= -\frac{1}{108}b^2fh^3x^6 + \frac{1}{6}fh^3(a+b\arcsin(cx))^2x^6 + \frac{1}{5}h^2(3fg+eh)(a+b\arcsin(cx))^2x^5 - \frac{2}{125}b^2h^2(3fg+eh)x^5 + \frac{bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^5}{18c} - \frac{5b^2fh^3x^4}{288c^2} + \frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2x^4 - \frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4 + \frac{2bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^4}{25c} + \frac{1}{3}g\left(fg^2+3h(eg+dh)\right)(a+b\arcsin(cx))^2x^3 - \frac{8b^2h^2(3fg+eh)x^3}{225c^2} - \frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3 + \frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{72c^3} + \frac{bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{8c} - \frac{5b^2fh^3x^2}{96c^4} + \frac{1}{2}g^2(eg+3dh)(a+b\arcsin(cx))^2x^2 - \frac{1}{4}b^2g^2(eg+3dh)x^2 - \frac{3b^2h\left(3fg^2+h(3eg+dh)\right)x^2}{32c^2} + \frac{8bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{75c^3} + \frac{2bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{9c} - 2b^2dg^3x + dg^3(a+b\arcsin(cx))^2x - \frac{16b^2h^2(3fg+eh)x}{75c^4} - \frac{4b^2g\left(fg^2+3h(eg+dh)\right)x}{9c^2} + \frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{48c^5} + \frac{bg^2(eg+3dh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{2c} + \frac{3bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{16c^3} - \frac{5fh^3(a+b\arcsin(cx))^2}{96c^6} - \frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2} - \frac{3h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2}{32c^4} + \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} + \frac{4bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}$$

```
[In] Int[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*g^3*x - (16*b^2*h^2*(3*f*g + e*h)*x)/(75*c^4) - (4*b^2*g*(f*g^2 +
3*h*(e*g + d*h))*x)/(9*c^2) - (5*b^2*f*h^3*x^2)/(96*c^4) - (b^2*g^2*(e*g +
3*d*h)*x^2)/4 - (3*b^2*h*(3*f*g^2 + h*(3*e*g + d*h))*x^2)/(32*c^2) - (8*b^2
*h^2*(3*f*g + e*h)*x^3)/(225*c^2) - (2*b^2*g*(f*g^2 + 3*h*(e*g + d*h))*x^3)
/27 - (5*b^2*f*h^3*x^4)/(288*c^2) - (b^2*h*(3*f*g^2 + h*(3*e*g + d*h))*x^4)
/32 - (2*b^2*h^2*(3*f*g + e*h)*x^5)/125 - (b^2*f*h^3*x^6)/108 + (2*b*d*g^3*
```

```
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*h^2*(3*f*g + e*h)*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^5) + (4*b*g*(f*g^2 + 3*h*(e*g + d*h))*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (5*b*f*h^3*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(48*c^5) + (b*g^2*(e*g + 3*d*h)*x*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(2*c) + (3*b*h*(3*f*g^2 + h*(3*e*g + d*h))*x*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c^3) + (8*b*h^2*(3*f*g + e*h)*x^2*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*g*(f*g^2 + 3*h*(e*g + d*
h))*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (5*b*f*h^3*x^3*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(72*c^3) + (b*h*(3*f*g^2 + h*(3*e*g + d*h
))*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (2*b*h^2*(3*f*g + e*h
)*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (b*f*h^3*x^5*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(18*c) - (5*f*h^3*(a + b*ArcSin[c*x])^2)/(96
*c^6) - (g^2*(e*g + 3*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2) - (3*h*(3*f*g^2 +
 h*(3*e*g + d*h))*(a + b*ArcSin[c*x])^2)/(32*c^4) + d*g^3*x*(a + b*ArcSin[c
*x])^2 + (g^2*(e*g + 3*d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 + (g*(f*g^2 + 3*h*
(e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(3*f*g^2 + h*(3*e*g + d*h))*
x^4*(a + b*ArcSin[c*x])^2)/4 + (h^2*(3*f*g + e*h)*x^5*(a + b*ArcSin[c*x])^2
)/5 + (f*h^3*x^6*(a + b*ArcSin[c*x])^2)/6
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4835

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \big(dg^3(a+b\arcsin(cx))^2 + g^2(eg+3dh)x(a+b\arcsin(cx))^2 \\
&\qquad + g\left(fg^2+3h(eg+dh)\right)x^2(a+b\arcsin(cx))^2 \\
&\qquad + h\left(3fg^2+h(3eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&\qquad + h^2(3fg+eh)x^4(a+b\arcsin(cx))^2 + fh^3x^5(a+b\arcsin(cx))^2\big)\,dx \\
&= \left(dg^3\right)\int (a+b\arcsin(cx))^2\,dx + \left(fh^3\right)\int x^5(a+b\arcsin(cx))^2\,dx \\
&\quad + \left(g^2(eg+3dh)\right)\int x(a+b\arcsin(cx))^2\,dx \\
&\quad + \left(h^2(3fg+eh)\right)\int x^4(a+b\arcsin(cx))^2\,dx \\
&\quad + \left(g\left(fg^2+3h(eg+dh)\right)\right)\int x^2(a+b\arcsin(cx))^2\,dx \\
&\quad + \left(h\left(3fg^2+h(3eg+dh)\right)\right)\int x^3(a+b\arcsin(cx))^2\,dx
\end{aligned}$$

$$
\begin{aligned}
&= dg^3x(a+b\arcsin(cx))^2+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2 \\
&\quad-\left(2bcdg^3\right)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{3}\left(bcfh^3\right)\int\frac{x^6(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad-\left(bcg^2(eg+3dh)\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad-\frac{1}{5}\left(2bch^2(3fg+eh)\right)\int\frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad-\frac{1}{3}\left(2bcg\left(fg^2+3h(eg+dh)\right)\right)\int\frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad-\frac{1}{2}\left(bch\left(3fg^2+h(3eg+dh)\right)\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&+ \frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&+ \frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&+ \frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + dg^3x(a+b\arcsin(cx))^2 \\
&+ \frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2 - \left(2b^2dg^3\right)\int 1\,dx - \frac{1}{18}\left(b^2fh^3\right)\int x^5\,dx \\
&- \frac{(5bfh^3)\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{18c} - \frac{1}{2}\left(b^2g^2(eg+3dh)\right)\int x\,dx \\
&- \frac{(bg^2(eg+3dh))\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c} - \frac{1}{25}\left(2b^2h^2(3fg+eh)\right)\int x^4\,dx \\
&- \frac{(8bh^2(3fg+eh))\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{25c} - \frac{1}{9}\left(2b^2g\left(fg^2+3h(eg+dh)\right)\right)\int x^2\,dx \\
&- \frac{(4bg(fg^2+3h(eg+dh)))\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c} \\
&- \frac{1}{8}\left(b^2h\left(3fg^2+h(3eg+dh)\right)\right)\int x^3\,dx \\
&- \frac{(3bh(3fg^2+h(3eg+dh)))\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^3x - \frac{1}{4}b^2g^2(eg+3dh)x^2 - \frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3 \\
&- \frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4 - \frac{2}{125}b^2h^2(3fg+eh)x^5 \\
&- \frac{1}{108}b^2fh^3x^6 + \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&+ \frac{4bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&+ \frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&+ \frac{3bh\left(3fg^2+h(3eg+dh)\right)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&+ \frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&+ \frac{2bg\left(fg^2+3h(eg+dh)\right)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&+ \frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3} \\
&+ \frac{bh\left(3fg^2+h(3eg+dh)\right)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&+ \frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2} \\
&+ dg^3x(a+b\arcsin(cx))^2 + \frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2 \\
&+ \frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2 - \frac{(5bfh^3)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{24c^3} - \frac{(5b^2fh^3)\int x^3\,dx}{72c^2} \\
&- \frac{(16bh^2(3fg+eh))\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{75c^3} - \frac{(8b^2h^2(3fg+eh))\int x^2\,dx}{75c^2} \\
&- \frac{(4b^2g(fg^2+3h(eg+dh)))\int 1\,dx}{9c^2} - \frac{(3bh(3fg^2+h(3eg+dh)))\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^3} \\
&- \frac{(3b^2h(3fg^2+h(3eg+dh)))\int x\,dx}{16c^2}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^3x - \frac{4b^2g(fg^2+3h(eg+dh))\,x}{9c^2} - \frac{1}{4}b^2g^2(eg+3dh)x^2 \\
&\quad - \frac{3b^2h(3fg^2+h(3eg+dh))\,x^2}{32c^2} - \frac{8b^2h^2(3fg+eh)x^3}{225c^2} \\
&\quad - \frac{2}{27}b^2g\big(fg^2+3h(eg+dh)\big)\,x^3 - \frac{5b^2fh^3x^4}{288c^2} - \frac{1}{32}b^2h\big(3fg^2+h(3eg+dh)\big)\,x^4 \\
&\quad - \frac{2}{125}b^2h^2(3fg+eh)x^5 - \frac{1}{108}b^2fh^3x^6 + \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4bg(fg^2+3h(eg+dh))\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{5bfh^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c^5} \\
&\quad + \frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(3fg^2+h(3eg+dh))\,x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&\quad + \frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3} \\
&\quad + \frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&\quad + \frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad - \frac{3h(3fg^2+h(3eg+dh))\,(a+b\arcsin(cx))^2}{32c^4} + dg^3x(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}g\big(fg^2+3h(eg+dh)\big)\,x^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h\big(3fg^2+h(3eg+dh)\big)\,x^4(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2 + \frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2 \\
&\quad - \frac{(5bfh^3)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{48c^5} - \frac{(5b^2fh^3)\int x\,dx}{48c^4} - \frac{(16b^2h^2(3fg+eh))\int 1\,dx}{75c^4}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^3x - \frac{16b^2h^2(3fg+eh)x}{75c^4} - \frac{4b^2g(fg^2+3h(eg+dh))\,x}{9c^2} - \frac{5b^2fh^3x^2}{96c^4} \\
&\quad - \frac{1}{4}b^2g^2(eg+3dh)x^2 - \frac{3b^2h(3fg^2+h(3eg+dh))\,x^2}{32c^2} - \frac{8b^2h^2(3fg+eh)x^3}{225c^2} \\
&\quad - \frac{2}{27}b^2g\big(fg^2+3h(eg+dh)\big)\,x^3 - \frac{5b^2fh^3x^4}{288c^2} - \frac{1}{32}b^2h\big(3fg^2+h(3eg+dh)\big)\,x^4 \\
&\quad - \frac{2}{125}b^2h^2(3fg+eh)x^5 - \frac{1}{108}b^2fh^3x^6 + \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4bg(fg^2+3h(eg+dh))\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{5bfh^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c^5} \\
&\quad + \frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(3fg^2+h(3eg+dh))\,x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&\quad + \frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3} \\
&\quad + \frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&\quad + \frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{5fh^3(a+b\arcsin(cx))^2}{96c^6} \\
&\quad - \frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2} - \frac{3h(3fg^2+h(3eg+dh))\,(a+b\arcsin(cx))^2}{32c^4} \\
&\quad + dg^3x(a+b\arcsin(cx))^2 + \frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}g\big(fg^2+3h(eg+dh)\big)\,x^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h\big(3fg^2+h(3eg+dh)\big)\,x^4(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2 + \frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.09 (sec) , antiderivative size = 734, normalized size of antiderivative = 0.72

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = dg^3x(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2$$
$$+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2$$
$$-\frac{2bg(fg^2+3h(eg+dh))\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3}$$
$$-\frac{2bh^2(3fg+eh)\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+\cdots\right)}{1125c^5}$$
$$-\frac{fh^3\left(45a^2-6abcx\sqrt{1-c^2x^2}(15+10c^2x^2+8c^4x^4)+b^2c^2x^2(45+15c^2x^2+8c^4x^4)-6b\left(-15a+bcx\sqrt{1-\cdots}\right.\right.}{864c^6}$$
$$-2bdg^3\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$
$$-\frac{1}{32}bh\left(3fg^2+h(3eg+dh)\right)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right)$$
$$-\frac{1}{4}bg^2(eg+3dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

```
[In] Integrate[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*g^3*x*(a + b*ArcSin[c*x])^2 + (g^2*(e*g + 3*d*h)*x^2*(a + b*ArcSin[c*x])^
2)/2 + (g*(f*g^2 + 3*h*(e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(3*f*
g^2 + h*(3*e*g + d*h))*x^4*(a + b*ArcSin[c*x])^2)/4 + (h^2*(3*f*g + e*h)*x^
5*(a + b*ArcSin[c*x])^2)/5 + (f*h^3*x^6*(a + b*ArcSin[c*x])^2)/6 - (2*b*g*(
f*g^2 + 3*h*(e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 +
 c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3) - (2
*b*h^2*(3*f*g + e*h)*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) +
 b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x
^2 + 3*c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - (f*h^3*(45*a^2 - 6*a*b*c*x*Sqrt[
1 - c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) + b^2*c^2*x^2*(45 + 15*c^2*x^2 +
 8*c^4*x^4) - 6*b*(-15*a + b*c*x*Sqrt[1 - c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4
*x^4))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(864*c^6) - 2*b*d*g^3*(b*x - (S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*h*(3*f*g^2 + h*(3*e*g + d*h))
*((3*b*x^2)/c^2 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 -
```

```
(4*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2
)/(b*c^4)))/32 - (b*g^2*(e*g + 3*d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

Maple [A] (verified)

Time = 3.22 (sec) , antiderivative size = 1734, normalized size of antiderivative = 1.71

method	result	size
derivativedivides	Expression too large to display	1734
default	Expression too large to display	1734
parts	Expression too large to display	1927

```
[In] int((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^5*(1/6*h^3*f*c^6*x^6+1/5*(c*e*h^3+3*c*f*g*h^2)*c^5*x^5+1/4*(c^2*
d*h^3+3*c^2*e*g*h^2+3*c^2*f*g^2*h)*c^4*x^4+1/3*(3*c^3*d*g*h^2+3*c^3*e*g^2*h
+c^3*f*g^3)*c^3*x^3+1/2*(3*c^4*d*g^2*h+c^4*e*g^3)*c^2*x^2+g^3*c^6*d*x)+b^2/
c^5*(c^5*d*g^3*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+1
/4*c^4*g^3*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-
arcsin(c*x)^2-c^2*x^2)+1/27*c^3*f*g^3*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+
1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12
*c*x)+3/4*g^2*c^4*h*d*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(
c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/9*c^3*e*g^2*h*(9*c^3*x^3*arcsin(c*x)^2+6*
(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)-12*c*x)+3/128*c^2*f*g^2*h*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)
^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-
12*arcsin(c*x)^2-12*c^2*x^2-9)+1/9*c^3*d*g*h^2*(9*c^3*x^3*arcsin(c*x)^2+6*(
-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)-12*c*x)+3/128*c^2*e*g*h^2*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-1
2*arcsin(c*x)^2-12*c^2*x^2-9)+1/375*c*f*g*h^2*(225*arcsin(c*x)^2*c^5*x^5+90
*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-240*c*x)+1
/128*h^3*d*c^2*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*
c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-12*arcsin(c*x)^2-12
*c^2*x^2-9)+1/1125*c*e*h^3*(225*arcsin(c*x)^2*c^5*x^5+90*(-c^2*x^2+1)^(1/2)
*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-
40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-240*c*x)+1/864*h^3*f*(144*arc
sin(c*x)^2*c^6*x^6+48*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*x^5-8*c^6*x^6+60*(
-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-15*c^4*x^4+90*(-c^2*x^2+1)^(1/2)*arcs
in(c*x)*x*c-45*arcsin(c*x)^2-45*c^2*x^2+68))+2*a*b/c^5*(1/6*arcsin(c*x)*h^3
*f*c^6*x^6+1/5*arcsin(c*x)*c^6*e*h^3*x^5+3/5*arcsin(c*x)*c^6*f*g*h^2*x^5+1/
4*arcsin(c*x)*c^6*d*h^3*x^4+3/4*arcsin(c*x)*c^6*e*g*h^2*x^4+3/4*arcsin(c*x)
*c^6*f*g^2*h*x^4+arcsin(c*x)*c^6*d*g*h^2*x^3+arcsin(c*x)*c^6*e*g^2*h*x^3+1/
```

```
3*arcsin(c*x)*c^6*f*g^3*x^3+3/2*arcsin(c*x)*c^6*d*g^2*h*x^2+1/2*arcsin(c*x)
*c^6*e*g^3*x^2+arcsin(c*x)*g^3*c^6*d*x-1/6*h^3*f*(-1/6*c^5*x^5*(-c^2*x^2+1)
^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arc
sin(c*x))+g^3*c^5*d*(-c^2*x^2+1)^(1/2)-1/60*(12*c*e*h^3+36*c*f*g*h^2)*(-1/5
*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+
1)^(1/2))-1/60*(90*c^4*d*g^2*h+30*c^4*e*g^3)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1
/2*arcsin(c*x))-1/60*(15*c^2*d*h^3+45*c^2*e*g*h^2+45*c^2*f*g^2*h)*(-1/4*c^3
*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/60*(6
0*c^3*d*g*h^2+60*c^3*e*g^2*h+20*c^3*f*g^3)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)
-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 1537, normalized size of antiderivative = 1.51

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas"
)
```

```
[Out] 1/108000*(1000*(18*a^2 - b^2)*c^6*f*h^3*x^6 + 864*(3*(25*a^2 - 2*b^2)*c^6*f
*g*h^2 + (25*a^2 - 2*b^2)*c^6*e*h^3)*x^5 + 375*(27*(8*a^2 - b^2)*c^6*f*g^2*
h + 27*(8*a^2 - b^2)*c^6*e*g*h^2 + (9*(8*a^2 - b^2)*c^6*d - 5*b^2*c^4*f)*h^
3)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^6*f*g^3 + 75*(9*a^2 - 2*b^2)*c^6*e*g^2*h
 - 24*b^2*c^4*e*h^3 + 3*(25*(9*a^2 - 2*b^2)*c^6*d - 24*b^2*c^4*f)*g*h^2)*x^
3 + 1125*(24*(2*a^2 - b^2)*c^6*e*g^3 - 27*b^2*c^4*e*g*h^2 + 9*(8*(2*a^2 - b
^2)*c^6*d - 3*b^2*c^4*f)*g^2*h - (9*b^2*c^4*d + 5*b^2*c^2*f)*h^3)*x^2 + 225
*(80*b^2*c^6*f*h^3*x^6 + 480*b^2*c^6*d*g^3*x - 120*b^2*c^4*e*g^3 - 135*b^2*
c^2*e*g*h^2 + 96*(3*b^2*c^6*f*g*h^2 + b^2*c^6*e*h^3)*x^5 + 120*(3*b^2*c^6*f
*g^2*h + 3*b^2*c^6*e*g*h^2 + b^2*c^6*d*h^3)*x^4 - 45*(8*b^2*c^4*d + 3*b^2*c
^2*f)*g^2*h - 5*(9*b^2*c^2*d + 5*b^2*f)*h^3 + 160*(b^2*c^6*f*g^3 + 3*b^2*c^
6*e*g^2*h + 3*b^2*c^6*d*g*h^2)*x^3 + 240*(b^2*c^6*e*g^3 + 3*b^2*c^6*d*g^2*h
)*x^2)*arcsin(c*x)^2 - 480*(300*b^2*c^4*e*g^2*h + 48*b^2*c^2*e*h^3 - 25*(9*
(a^2 - 2*b^2)*c^6*d - 4*b^2*c^4*f)*g^3 + 12*(25*b^2*c^4*d + 12*b^2*c^2*f)*g
*h^2)*x + 450*(80*a*b*c^6*f*h^3*x^6 + 480*a*b*c^6*d*g^3*x - 120*a*b*c^4*e*g
^3 - 135*a*b*c^2*e*g*h^2 + 96*(3*a*b*c^6*f*g*h^2 + a*b*c^6*e*h^3)*x^5 + 120
*(3*a*b*c^6*f*g^2*h + 3*a*b*c^6*e*g*h^2 + a*b*c^6*d*h^3)*x^4 - 45*(8*a*b*c^
4*d + 3*a*b*c^2*f)*g^2*h - 5*(9*a*b*c^2*d + 5*a*b*f)*h^3 + 160*(a*b*c^6*f*g
^3 + 3*a*b*c^6*e*g^2*h + 3*a*b*c^6*d*g*h^2)*x^3 + 240*(a*b*c^6*e*g^3 + 3*a*
b*c^6*d*g^2*h)*x^2)*arcsin(c*x) + 30*(200*a*b*c^5*f*h^3*x^5 + 4800*a*b*c^3*
e*g^2*h + 768*a*b*c*e*h^3 + 288*(3*a*b*c^5*f*g*h^2 + a*b*c^5*e*h^3)*x^4 + 8
00*(9*a*b*c^5*d + 2*a*b*c^3*f)*g^3 + 192*(25*a*b*c^3*d + 12*a*b*c*f)*g*h^2
+ 50*(27*a*b*c^5*f*g^2*h + 27*a*b*c^5*e*g*h^2 + (9*a*b*c^5*d + 5*a*b*c^3*f)
```

```
*h^3)*x^3 + 32*(25*a*b*c^5*f*g^3 + 75*a*b*c^5*e*g^2*h + 12*a*b*c^3*e*h^3 +
3*(25*a*b*c^5*d + 12*a*b*c^3*f)*g*h^2)*x^2 + 75*(24*a*b*c^5*e*g^3 + 27*a*b*
c^3*e*g*h^2 + 9*(8*a*b*c^5*d + 3*a*b*c^3*f)*g^2*h + (9*a*b*c^3*d + 5*a*b*c*
f)*h^3)*x + (200*b^2*c^5*f*h^3*x^5 + 4800*b^2*c^3*e*g^2*h + 768*b^2*c*e*h^3
 + 288*(3*b^2*c^5*f*g*h^2 + b^2*c^5*e*h^3)*x^4 + 800*(9*b^2*c^5*d + 2*b^2*c
^3*f)*g^3 + 192*(25*b^2*c^3*d + 12*b^2*c*f)*g*h^2 + 50*(27*b^2*c^5*f*g^2*h
+ 27*b^2*c^5*e*g*h^2 + (9*b^2*c^5*d + 5*b^2*c^3*f)*h^3)*x^3 + 32*(25*b^2*c^
5*f*g^3 + 75*b^2*c^5*e*g^2*h + 12*b^2*c^3*e*h^3 + 3*(25*b^2*c^5*d + 12*b^2*
c^3*f)*g*h^2)*x^2 + 75*(24*b^2*c^5*e*g^3 + 27*b^2*c^3*e*g*h^2 + 9*(8*b^2*c^
5*d + 3*b^2*c^3*f)*g^2*h + (9*b^2*c^3*d + 5*b^2*c*f)*h^3)*x)*arcsin(c*x))*s
qrt(-c^2*x^2 + 1))/c^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2992 vs. 2(1006) = 2012.

Time = 1.11 (sec) , antiderivative size = 2992, normalized size of antiderivative = 2.94

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)**3*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*g**3*x + 3*a**2*d*g**2*h*x**2/2 + a**2*d*g*h**2*x**3 + a*
*2*d*h**3*x**4/4 + a**2*e*g**3*x**2/2 + a**2*e*g**2*h*x**3 + 3*a**2*e*g*h**
2*x**4/4 + a**2*e*h**3*x**5/5 + a**2*f*g**3*x**3/3 + 3*a**2*f*g**2*h*x**4/4
 + 3*a**2*f*g*h**2*x**5/5 + a**2*f*h**3*x**6/6 + 2*a*b*d*g**3*x*asin(c*x) +
 3*a*b*d*g**2*h*x**2*asin(c*x) + 2*a*b*d*g*h**2*x**3*asin(c*x) + a*b*d*h**3
*x**4*asin(c*x)/2 + a*b*e*g**3*x**2*asin(c*x) + 2*a*b*e*g**2*h*x**3*asin(c*
x) + 3*a*b*e*g*h**2*x**4*asin(c*x)/2 + 2*a*b*e*h**3*x**5*asin(c*x)/5 + 2*a*
b*f*g**3*x**3*asin(c*x)/3 + 3*a*b*f*g**2*h*x**4*asin(c*x)/2 + 6*a*b*f*g*h**
2*x**5*asin(c*x)/5 + a*b*f*h**3*x**6*asin(c*x)/3 + 2*a*b*d*g**3*sqrt(-c**2*
x**2 + 1)/c + 3*a*b*d*g**2*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*d*g*h**2*
x**2*sqrt(-c**2*x**2 + 1)/(3*c) + a*b*d*h**3*x**3*sqrt(-c**2*x**2 + 1)/(8*c
) + a*b*e*g**3*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*e*g**2*h*x**2*sqrt(-c**
2*x**2 + 1)/(3*c) + 3*a*b*e*g*h**2*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + 2*a*b*
e*h**3*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*f*g**3*x**2*sqrt(-c**2*x**2
 + 1)/(9*c) + 3*a*b*f*g**2*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + 6*a*b*f*g*h*
*2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + a*b*f*h**3*x**5*sqrt(-c**2*x**2 + 1)/
(18*c) - 3*a*b*d*g**2*h*asin(c*x)/(2*c**2) - a*b*e*g**3*asin(c*x)/(2*c**2)
+ 4*a*b*d*g*h**2*sqrt(-c**2*x**2 + 1)/(3*c**3) + 3*a*b*d*h**3*x*sqrt(-c**2*
x**2 + 1)/(16*c**3) + 4*a*b*e*g**2*h*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*a*b*
e*g*h**2*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 8*a*b*e*h**3*x**2*sqrt(-c**2*x*
*2 + 1)/(75*c**3) + 4*a*b*f*g**3*sqrt(-c**2*x**2 + 1)/(9*c**3) + 9*a*b*f*g*
*2*h*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 8*a*b*f*g*h**2*x**2*sqrt(-c**2*x**2
 + 1)/(25*c**3) + 5*a*b*f*h**3*x**3*sqrt(-c**2*x**2 + 1)/(72*c**3) - 3*a*b*
```

```
d*h**3*asin(c*x)/(16*c**4) - 9*a*b*e*g*h**2*asin(c*x)/(16*c**4) - 9*a*b*f*g
**2*h*asin(c*x)/(16*c**4) + 16*a*b*e*h**3*sqrt(-c**2*x**2 + 1)/(75*c**5) +
16*a*b*f*g*h**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 5*a*b*f*h**3*x*sqrt(-c**2*
x**2 + 1)/(48*c**5) - 5*a*b*f*h**3*asin(c*x)/(48*c**6) + b**2*d*g**3*x*asin
(c*x)**2 - 2*b**2*d*g**3*x + 3*b**2*d*g**2*h*x**2*asin(c*x)**2/2 - 3*b**2*d
*g**2*h*x**2/4 + b**2*d*g*h**2*x**3*asin(c*x)**2 - 2*b**2*d*g*h**2*x**3/9 +
 b**2*d*h**3*x**4*asin(c*x)**2/4 - b**2*d*h**3*x**4/32 + b**2*e*g**3*x**2*a
sin(c*x)**2/2 - b**2*e*g**3*x**2/4 + b**2*e*g**2*h*x**3*asin(c*x)**2 - 2*b*
*2*e*g**2*h*x**3/9 + 3*b**2*e*g*h**2*x**4*asin(c*x)**2/4 - 3*b**2*e*g*h**2*
x**4/32 + b**2*e*h**3*x**5*asin(c*x)**2/5 - 2*b**2*e*h**3*x**5/125 + b**2*f
*g**3*x**3*asin(c*x)**2/3 - 2*b**2*f*g**3*x**3/27 + 3*b**2*f*g**2*h*x**4*as
in(c*x)**2/4 - 3*b**2*f*g**2*h*x**4/32 + 3*b**2*f*g*h**2*x**5*asin(c*x)**2/
5 - 6*b**2*f*g*h**2*x**5/125 + b**2*f*h**3*x**6*asin(c*x)**2/6 - b**2*f*h**
3*x**6/108 + 2*b**2*d*g**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + 3*b**2*d*g**2
*h*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 2*b**2*d*g*h**2*x**2*sqrt(-c**2
*x**2 + 1)*asin(c*x)/(3*c) + b**2*d*h**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x
)/(8*c) + b**2*e*g**3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 2*b**2*e*g**
2*h*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c) + 3*b**2*e*g*h**2*x**3*sqrt(-
c**2*x**2 + 1)*asin(c*x)/(8*c) + 2*b**2*e*h**3*x**4*sqrt(-c**2*x**2 + 1)*as
in(c*x)/(25*c) + 2*b**2*f*g**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) +
3*b**2*f*g**2*h*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*c) + 6*b**2*f*g*h**2
*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) + b**2*f*h**3*x**5*sqrt(-c**2*x
**2 + 1)*asin(c*x)/(18*c) - 3*b**2*d*g**2*h*asin(c*x)**2/(4*c**2) - 4*b**2*
d*g*h**2*x/(3*c**2) - 3*b**2*d*h**3*x**2/(32*c**2) - b**2*e*g**3*asin(c*x)*
*2/(4*c**2) - 4*b**2*e*g**2*h*x/(3*c**2) - 9*b**2*e*g*h**2*x**2/(32*c**2) -
 8*b**2*e*h**3*x**3/(225*c**2) - 4*b**2*f*g**3*x/(9*c**2) - 9*b**2*f*g**2*h
*x**2/(32*c**2) - 8*b**2*f*g*h**2*x**3/(75*c**2) - 5*b**2*f*h**3*x**4/(288*
c**2) + 4*b**2*d*g*h**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 3*b**2*d*
h**3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(16*c**3) + 4*b**2*e*g**2*h*sqrt(-c**
2*x**2 + 1)*asin(c*x)/(3*c**3) + 9*b**2*e*g*h**2*x*sqrt(-c**2*x**2 + 1)*asi
n(c*x)/(16*c**3) + 8*b**2*e*h**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c*
*3) + 4*b**2*f*g**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3) + 9*b**2*f*g**2
*h*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(16*c**3) + 8*b**2*f*g*h**2*x**2*sqrt(-
c**2*x**2 + 1)*asin(c*x)/(25*c**3) + 5*b**2*f*h**3*x**3*sqrt(-c**2*x**2 + 1
)*asin(c*x)/(72*c**3) - 3*b**2*d*h**3*asin(c*x)**2/(32*c**4) - 9*b**2*e*g*h
**2*asin(c*x)**2/(32*c**4) - 16*b**2*e*h**3*x/(75*c**4) - 9*b**2*f*g**2*h*a
sin(c*x)**2/(32*c**4) - 16*b**2*f*g*h**2*x/(25*c**4) - 5*b**2*f*h**3*x**2/(
96*c**4) + 16*b**2*e*h**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**5) + 16*b**
2*f*g*h**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c**5) + 5*b**2*f*h**3*x*sqrt(
-c**2*x**2 + 1)*asin(c*x)/(48*c**5) - 5*b**2*f*h**3*asin(c*x)**2/(96*c**6),
 Ne(c, 0)), (a**2*(d*g**3*x + 3*d*g**2*h*x**2/2 + d*g*h**2*x**3 + d*h**3*x*
*4/4 + e*g**3*x**2/2 + e*g**2*h*x**3 + 3*e*g*h**2*x**4/4 + e*h**3*x**5/5 +
f*g**3*x**3/3 + 3*f*g**2*h*x**4/4 + 3*f*g*h**2*x**5/5 + f*h**3*x**6/6), Tru
e))
```

Maxima [F]

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$
$$= \int \left(fx^2+ex+d\right)(hx+g)^3 (b\arcsin(cx)+a)^2 \, dx$$

```
[In] integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima"
)
```

```
[Out] 1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^2
*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^2*
e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 1/2*a^2*e*g^3*x
^2 + 3/2*a^2*d*g^2*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
/c^2 - arcsin(c*x)/c^3))*a*b*e*g^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^3 + 3/2*(2*x^2*arcsin
(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g^2*h + 2/3*(
3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^
4))*a*b*e*g^2*h + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 +
 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g^2*h + 2/3*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*
a*b*d*g*h^2 + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*g*h^2 + 2/25*(15*x^5*
arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
+ 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*f*g*h^2 + 1/16*(8*x^4*arcsin(c*x) + (2*s
qrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)
*c)*a*b*d*h^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 +
4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*e*h^3 + 1/1
44*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 +
 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*f*h^
3 - 2*b^2*d*g^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g^3*x + 2*(c
*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d*g^3/c + 1/60*(10*b^2*f*h^3*x^6 +
 12*(3*b^2*f*g*h^2 + b^2*e*h^3)*x^5 + 15*(3*b^2*f*g^2*h + 3*b^2*e*g*h^2 + b
^2*d*h^3)*x^4 + 20*(b^2*f*g^3 + 3*b^2*e*g^2*h + 3*b^2*d*g*h^2)*x^3 + 30*(b^
2*e*g^3 + 3*b^2*d*g^2*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ integrate(1/30*(10*b^2*c*f*h^3*x^6 + 12*(3*b^2*c*f*g*h^2 + b^2*c*e*h^3)*x
^5 + 15*(3*b^2*c*f*g^2*h + 3*b^2*c*e*g*h^2 + b^2*c*d*h^3)*x^4 + 20*(b^2*c*f
*g^3 + 3*b^2*c*e*g^2*h + 3*b^2*c*d*g*h^2)*x^3 + 30*(b^2*c*e*g^3 + 3*b^2*c*d
*g^2*h)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3444 vs. $2(932) = 1864$.

Time = 0.39 (sec) , antiderivative size = 3444, normalized size of antiderivative = 3.39

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^2
*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^2*
e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 2*a*b*d*g^3*x*a
rcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1
)*b^2*e*g^2*h*x*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*g*h^2*x*arcsin(c*x)
^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^3*x*arcsin(c*x)/c + 3/2*sqrt(-c^2*x
^2 + 1)*b^2*d*g^2*h*x*arcsin(c*x)/c + a^2*d*g^3*x - 2*b^2*d*g^3*x + 2/3*(c^
2*x^2 - 1)*a*b*f*g^3*x*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*e*g^2*h*x*arcs
in(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*h^2*x*arcsin(c*x)/c^2 + 1/2*(c^2*x^2
- 1)*b^2*e*g^3*arcsin(c*x)^2/c^2 + 3/2*(c^2*x^2 - 1)*b^2*d*g^2*h*arcsin(c*x
)^2/c^2 + 1/3*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + b^2*e*g^2*h*x*arcsin(c*x)^2/c
^2 + b^2*d*g*h^2*x*arcsin(c*x)^2/c^2 + 3/5*(c^2*x^2 - 1)^2*b^2*f*g*h^2*x*ar
csin(c*x)^2/c^4 + 1/5*(c^2*x^2 - 1)^2*b^2*e*h^3*x*arcsin(c*x)^2/c^4 + 1/2*s
qrt(-c^2*x^2 + 1)*a*b*e*g^3*x/c + 3/2*sqrt(-c^2*x^2 + 1)*a*b*d*g^2*h*x/c +
2*sqrt(-c^2*x^2 + 1)*b^2*d*g^3*arcsin(c*x)/c - 3/8*(-c^2*x^2 + 1)^(3/2)*b^2
*f*g^2*h*x*arcsin(c*x)/c^3 - 3/8*(-c^2*x^2 + 1)^(3/2)*b^2*e*g*h^2*x*arcsin(
c*x)/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*h^3*x*arcsin(c*x)/c^3 - 2/27*(c^2
*x^2 - 1)*b^2*f*g^3*x/c^2 - 2/9*(c^2*x^2 - 1)*b^2*e*g^2*h*x/c^2 - 2/9*(c^2*
x^2 - 1)*b^2*d*g*h^2*x/c^2 + (c^2*x^2 - 1)*a*b*e*g^3*arcsin(c*x)/c^2 + 3*(c
^2*x^2 - 1)*a*b*d*g^2*h*arcsin(c*x)/c^2 + 2/3*a*b*f*g^3*x*arcsin(c*x)/c^2 +
 2*a*b*e*g^2*h*x*arcsin(c*x)/c^2 + 2*a*b*d*g*h^2*x*arcsin(c*x)/c^2 + 6/5*(c
^2*x^2 - 1)^2*a*b*f*g*h^2*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)^2*a*b*e*h^3
*x*arcsin(c*x)/c^4 + 1/4*b^2*e*g^3*arcsin(c*x)^2/c^2 + 3/4*b^2*d*g^2*h*arcs
in(c*x)^2/c^2 + 3/4*(c^2*x^2 - 1)^2*b^2*f*g^2*h*arcsin(c*x)^2/c^4 + 3/4*(c^
2*x^2 - 1)^2*b^2*e*g*h^2*arcsin(c*x)^2/c^4 + 1/4*(c^2*x^2 - 1)^2*b^2*d*h^3*
arcsin(c*x)^2/c^4 + 6/5*(c^2*x^2 - 1)*b^2*f*g*h^2*x*arcsin(c*x)^2/c^4 + 2/5
*(c^2*x^2 - 1)*b^2*e*h^3*x*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*g
^3/c - 3/8*(-c^2*x^2 + 1)^(3/2)*a*b*f*g^2*h*x/c^3 - 3/8*(-c^2*x^2 + 1)^(3/2
)*a*b*e*g*h^2*x/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*d*h^3*x/c^3 - 2/9*(-c^2*
x^2 + 1)^(3/2)*b^2*f*g^3*arcsin(c*x)/c^3 - 2/3*(-c^2*x^2 + 1)^(3/2)*b^2*e*g
^2*h*arcsin(c*x)/c^3 - 2/3*(-c^2*x^2 + 1)^(3/2)*b^2*d*g*h^2*arcsin(c*x)/c^3
 + 15/16*sqrt(-c^2*x^2 + 1)*b^2*f*g^2*h*x*arcsin(c*x)/c^3 + 15/16*sqrt(-c^2
*x^2 + 1)*b^2*e*g*h^2*x*arcsin(c*x)/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*b^2*d*h^3
*x*arcsin(c*x)/c^3 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*f*h^3*x*ar
csin(c*x)/c^5 + 1/2*(c^2*x^2 - 1)*a^2*e*g^3/c^2 - 1/4*(c^2*x^2 - 1)*b^2*e*g
```

^3/c^2 + 3/2*(c^2*x^2 - 1)*a^2*d*g^2*h/c^2 - 3/4*(c^2*x^2 - 1)*b^2*d*g^2*h/
c^2 - 14/27*b^2*f*g^3*x/c^2 - 14/9*b^2*e*g^2*h*x/c^2 - 14/9*b^2*d*g*h^2*x/c
^2 - 6/125*(c^2*x^2 - 1)^2*b^2*f*g*h^2*x/c^4 - 2/125*(c^2*x^2 - 1)^2*b^2*e*
h^3*x/c^4 + 1/2*a*b*e*g^3*arcsin(c*x)/c^2 + 3/2*a*b*d*g^2*h*arcsin(c*x)/c^2
 + 3/2*(c^2*x^2 - 1)^2*a*b*f*g^2*h*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)^2*a*
b*e*g*h^2*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*a*b*d*h^3*arcsin(c*x)/c^4 +
 12/5*(c^2*x^2 - 1)*a*b*f*g*h^2*x*arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*a*b*e
*h^3*x*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b^2*f*g^2*h*arcsin(c*x)^2/c^4 +
3/2*(c^2*x^2 - 1)*b^2*e*g*h^2*arcsin(c*x)^2/c^4 + 1/2*(c^2*x^2 - 1)*b^2*d*h
^3*arcsin(c*x)^2/c^4 + 1/6*(c^2*x^2 - 1)^3*b^2*f*h^3*arcsin(c*x)^2/c^6 + 3/
5*b^2*f*g*h^2*x*arcsin(c*x)^2/c^4 + 1/5*b^2*e*h^3*x*arcsin(c*x)^2/c^4 - 2/9
*(-c^2*x^2 + 1)^(3/2)*a*b*f*g^3/c^3 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*e*g^2*h/
c^3 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d*g*h^2/c^3 + 15/16*sqrt(-c^2*x^2 + 1)*a
*b*f*g^2*h*x/c^3 + 15/16*sqrt(-c^2*x^2 + 1)*a*b*e*g*h^2*x/c^3 + 5/16*sqrt(-
c^2*x^2 + 1)*a*b*d*h^3*x/c^3 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*
f*h^3*x/c^5 + 2/3*sqrt(-c^2*x^2 + 1)*b^2*f*g^3*arcsin(c*x)/c^3 + 2*sqrt(-c^
2*x^2 + 1)*b^2*e*g^2*h*arcsin(c*x)/c^3 + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g*h^2*a
rcsin(c*x)/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*f*g*h^2*arcsin
(c*x)/c^5 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*e*h^3*arcsin(c*x)/c
^5 - 13/72*(-c^2*x^2 + 1)^(3/2)*b^2*f*h^3*x*arcsin(c*x)/c^5 - 1/8*b^2*e*g^3
/c^2 - 3/8*b^2*d*g^2*h/c^2 - 3/32*(c^2*x^2 - 1)^2*b^2*f*g^2*h/c^4 - 3/32*(c
^2*x^2 - 1)^2*b^2*e*g*h^2/c^4 - 1/32*(c^2*x^2 - 1)^2*b^2*d*h^3/c^4 - 76/375
*(c^2*x^2 - 1)*b^2*f*g*h^2*x/c^4 - 76/1125*(c^2*x^2 - 1)*b^2*e*h^3*x/c^4 +
3*(c^2*x^2 - 1)*a*b*f*g^2*h*arcsin(c*x)/c^4 + 3*(c^2*x^2 - 1)*a*b*e*g*h^2*a
rcsin(c*x)/c^4 + (c^2*x^2 - 1)*a*b*d*h^3*arcsin(c*x)/c^4 + 1/3*(c^2*x^2 - 1
)^3*a*b*f*h^3*arcsin(c*x)/c^6 + 6/5*a*b*f*g*h^2*x*arcsin(c*x)/c^4 + 2/5*a*b
*e*h^3*x*arcsin(c*x)/c^4 + 15/32*b^2*f*g^2*h*arcsin(c*x)^2/c^4 + 15/32*b^2*
e*g*h^2*arcsin(c*x)^2/c^4 + 5/32*b^2*d*h^3*arcsin(c*x)^2/c^4 + 1/2*(c^2*x^2
 - 1)^2*b^2*f*h^3*arcsin(c*x)^2/c^6 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*f*g^3/c^3
+ 2*sqrt(-c^2*x^2 + 1)*a*b*e*g^2*h/c^3 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*g*h^2/c
^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*f*g*h^2/c^5 + 2/25*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e*h^3/c^5 - 13/72*(-c^2*x^2 + 1)^(3/2)*a*b*
f*h^3*x/c^5 - 4/5*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*h^2*arcsin(c*x)/c^5 - 4/15*(
-c^2*x^2 + 1)^(3/2)*b^2*e*h^3*arcsin(c*x)/c^5 + 11/48*sqrt(-c^2*x^2 + 1)*b^
2*f*h^3*x*arcsin(c*x)/c^5 - 15/32*(c^2*x^2 - 1)*b^2*f*g^2*h/c^4 - 15/32*(c^
2*x^2 - 1)*b^2*e*g*h^2/c^4 - 5/32*(c^2*x^2 - 1)*b^2*d*h^3/c^4 - 1/108*(c^2*
x^2 - 1)^3*b^2*f*h^3/c^6 - 298/375*b^2*f*g*h^2*x/c^4 - 298/1125*b^2*e*h^3*x
/c^4 + 15/16*a*b*f*g^2*h*arcsin(c*x)/c^4 + 15/16*a*b*e*g*h^2*arcsin(c*x)/c^
4 + 5/16*a*b*d*h^3*arcsin(c*x)/c^4 + (c^2*x^2 - 1)^2*a*b*f*h^3*arcsin(c*x)/
c^6 + 1/2*(c^2*x^2 - 1)*b^2*f*h^3*arcsin(c*x)^2/c^6 - 4/5*(-c^2*x^2 + 1)^(3
/2)*a*b*f*g*h^2/c^5 - 4/15*(-c^2*x^2 + 1)^(3/2)*a*b*e*h^3/c^5 + 11/48*sqrt(
-c^2*x^2 + 1)*a*b*f*h^3*x/c^5 + 6/5*sqrt(-c^2*x^2 + 1)*b^2*f*g*h^2*arcsin(c
*x)/c^5 + 2/5*sqrt(-c^2*x^2 + 1)*b^2*e*h^3*arcsin(c*x)/c^5 - 51/256*b^2*f*g
^2*h/c^4 - 51/256*b^2*e*g*h^2/c^4 - 17/256*b^2*d*h^3/c^4 - 13/288*(c^2*x^2
- 1)^2*b^2*f*h^3/c^6 + (c^2*x^2 - 1)*a*b*f*h^3*arcsin(c*x)/c^6 + 11/96*b^2*

```
f*h^3*arcsin(c*x)^2/c^6 + 6/5*sqrt(-c^2*x^2 + 1)*a*b*f*g*h^2/c^5 + 2/5*sqrt
(-c^2*x^2 + 1)*a*b*e*h^3/c^5 - 11/96*(c^2*x^2 - 1)*b^2*f*h^3/c^6 + 11/48*a*
b*f*h^3*arcsin(c*x)/c^6 - 299/6912*b^2*f*h^3/c^6
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \int (g+h\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right) \,dx$$

```
[In] int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
[Out] int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

3.116 $\int (g+hx)^2 (d+ex+fx^2) (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 28, antiderivative size = 701

$$\begin{aligned}
&\int (g+hx)^2 (d+ex+fx^2) (a+b\arcsin(cx))^2 \, dx \\
&= -2b^2dg^2x - \frac{16b^2fh^2x}{75c^4} - \frac{4b^2(fg^2+h(2eg+dh))\,x}{9c^2} - \frac{1}{4}b^2g(eg+2dh)x^2 \\
&\quad - \frac{3b^2h(2fg+eh)x^2}{32c^2} - \frac{8b^2fh^2x^3}{225c^2} - \frac{2}{27}b^2\left(fg^2+h(2eg+dh)\right)x^3 - \frac{1}{32}b^2h(2fg+eh)x^4 \\
&\quad - \frac{2}{125}b^2fh^2x^5 + \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4b(fg^2+h(2eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(2fg+eh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} + \frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2b(fg^2+h(2eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&\quad - \frac{g(eg+2dh)(a+b\arcsin(cx))^2}{4c^2} - \frac{3h(2fg+eh)(a+b\arcsin(cx))^2}{32c^4} \\
&\quad + dg^2x(a+b\arcsin(cx))^2 + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2
\end{aligned}$$

```
[Out] 2*b*d*g^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+16/75*b*f*h^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c^5+2/9*b*(f*g^2+h*(d*h+2*e*g))*x^2*(a+b*arcsin(c*
x))*(-c^2*x^2+1)^(1/2)/c+4/9*b*(f*g^2+h*(d*h+2*e*g))*(a+b*arcsin(c*x))*(-c^
2*x^2+1)^(1/2)/c^3-16/75*b^2*f*h^2*x/c^4-3/32*b^2*h*(e*h+2*f*g)*x^2/c^2-8/2
25*b^2*f*h^2*x^3/c^2+d*g^2*x*(a+b*arcsin(c*x))^2+1/2*g*(2*d*h+e*g)*x^2*(a+b
*arcsin(c*x))^2+1/4*h*(e*h+2*f*g)*x^4*(a+b*arcsin(c*x))^2+1/5*f*h^2*x^5*(a+
b*arcsin(c*x))^2-2*b^2*d*g^2*x-4/9*b^2*(f*g^2+h*(d*h+2*e*g))*x/c^2-1/4*b^2*
g*(2*d*h+e*g)*x^2-1/32*b^2*h*(e*h+2*f*g)*x^4-2/125*b^2*f*h^2*x^5-1/4*g*(2*d
*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32*h*(e*h+2*f*g)*(a+b*arcsin(c*x))^2/c^4+
1/2*b*g*(2*d*h+e*g)*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+3/16*b*h*(e*h+
2*f*g)*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+8/75*b*f*h^2*x^2*(a+b*arc
sin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/8*b*h*(e*h+2*f*g)*x^3*(a+b*arcsin(c*x))*
(-c^2*x^2+1)^(1/2)/c+2/25*b*f*h^2*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/
c-2/27*b^2*(f*g^2+h*(d*h+2*e*g))*x^3+1/3*(f*g^2+h*(d*h+2*e*g))*x^3*(a+b*arc
sin(c*x))^2
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 701, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used

$= \{4835, 4715, 4767, 8, 4723, 4795, 4737, 30\}$

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= -\frac{3h(eh+2fg)(a+b\arcsin(cx))^2}{32c^4} + \frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c} + \frac{bgx\sqrt{1-c^2x^2}(2dh+eg)(a+b\arcsin(cx))}{2c} - \frac{g(2dh+eg)(a+b\arcsin(cx))^2}{4c^2} + \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bhx^3\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{8c} + \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + \frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} + \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c^3} + \frac{3bhx\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{16c^3} + \frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} + \frac{1}{3}x^3(a+b\arcsin(cx))^2\left(h(dh+2eg)+fg^2\right) + \frac{1}{2}gx^2(2dh+eg)(a+b\arcsin(cx))^2 + dg^2x(a+b\arcsin(cx))^2 + \frac{1}{4}hx^4(eh+2fg)(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2 - \frac{16b^2fh^2x}{75c^4} - \frac{4b^2x\left(h(dh+2eg)+fg^2\right)}{9c^2} - \frac{3b^2hx^2(eh+2fg)}{32c^2} - \frac{8b^2fh^2x^3}{225c^2} - \frac{2}{27}b^2x^3\left(h(dh+2eg)+fg^2\right) - \frac{1}{4}b^2gx^2(2dh+eg) - 2b^2dg^2x - \frac{1}{32}b^2hx^4(eh+2fg) - \frac{2}{125}b^2fh^2x^5$$

```
[In] Int[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*g^2*x - (16*b^2*f*h^2*x)/(75*c^4) - (4*b^2*(f*g^2 + h*(2*e*g + d*h
))*x)/(9*c^2) - (b^2*g*(e*g + 2*d*h)*x^2)/4 - (3*b^2*h*(2*f*g + e*h)*x^2)/(
32*c^2) - (8*b^2*f*h^2*x^3)/(225*c^2) - (2*b^2*(f*g^2 + h*(2*e*g + d*h))*x^
3)/27 - (b^2*h*(2*f*g + e*h)*x^4)/32 - (2*b^2*f*h^2*x^5)/125 + (2*b*d*g^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*f*h^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(75*c^5) + (4*b*(f*g^2 + h*(2*e*g + d*h))*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(9*c^3) + (b*g*(e*g + 2*d*h)*x*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(2*c) + (3*b*h*(2*f*g + e*h)*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(16*c^3) + (8*b*f*h^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(75*c^3) + (2*b*(f*g^2 + h*(2*e*g + d*h))*x^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(9*c) + (b*h*(2*f*g + e*h)*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x]))/(8*c) + (2*b*f*h^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*
c) - (g*(e*g + 2*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2) - (3*h*(2*f*g + e*h)*(
a + b*ArcSin[c*x])^2)/(32*c^4) + d*g^2*x*(a + b*ArcSin[c*x])^2 + (g*(e*g +
```

```
2*d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 + ((f*g^2 + h*(2*e*g + d*h))*x^3*(a + b
*ArcSin[c*x])^2)/3 + (h*(2*f*g + e*h)*x^4*(a + b*ArcSin[c*x])^2)/4 + (f*h^2
*x^5*(a + b*ArcSin[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
```

```
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4835

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(dg^2(a+b\arcsin(cx))^2+g(eg+2dh)x(a+b\arcsin(cx))^2 \right.\\
&\quad +\left(fg^2+h(2eg+dh)\right)x^2(a+b\arcsin(cx))^2+h(2fg+eh)x^3(a+b\arcsin(cx))^2\\
&\quad \left. +fh^2x^4(a+b\arcsin(cx))^2\right)\,dx\\
&= \left(dg^2\right)\int (a+b\arcsin(cx))^2\,dx+\left(fh^2\right)\int x^4(a+b\arcsin(cx))^2\,dx\\
&\quad +(g(eg+2dh))\int x(a+b\arcsin(cx))^2\,dx+(h(2fg+eh))\int x^3(a+b\arcsin(cx))^2\,dx\\
&\quad +\left(fg^2+h(2eg+dh)\right)\int x^2(a+b\arcsin(cx))^2\,dx\\
&= dg^2x(a+b\arcsin(cx))^2+\frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2\\
&\quad +\frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2\\
&\quad +\frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2+\frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2\\
&\quad -\left(2bcdg^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{5}\left(2bcfh^2\right)\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&\quad -(bcg(eg+2dh))\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&\quad -\frac{1}{2}(bch(2fg+eh))\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&\quad -\frac{1}{3}\left(2bc\left(fg^2+h(2eg+dh)\right)\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$
\begin{aligned}
&= \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&+ \frac{2b(fg^2+h(2eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&+ \frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + dg^2x(a+b\arcsin(cx))^2 \\
&+ \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2 \\
&- \left(2b^2dg^2\right)\int 1\,dx - \frac{1}{25}\left(2b^2fh^2\right)\int x^4\,dx - \frac{\left(8bfh^2\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{25c} \\
&- \frac{1}{2}\left(b^2g(eg+2dh)\right)\int x\,dx - \frac{(bg(eg+2dh))\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c} \\
&- \frac{1}{8}\left(b^2h(2fg+eh)\right)\int x^3\,dx - \frac{(3bh(2fg+eh))\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c} \\
&- \frac{1}{9}\left(2b^2\left(fg^2+h(2eg+dh)\right)\right)\int x^2\,dx - \frac{(4b(fg^2+h(2eg+dh)))\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^2x - \frac{1}{4}b^2g(eg+2dh)x^2 - \frac{2}{27}b^2\left(fg^2+h(2eg+dh)\right)x^3 \\
&\quad - \frac{1}{32}b^2h(2fg+eh)x^4 - \frac{2}{125}b^2fh^2x^5 + \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{4b(fg^2+h(2eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(2fg+eh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&\quad + \frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2b(fg^2+h(2eg+dh))x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} - \frac{g(eg+2dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad + dg^2x(a+b\arcsin(cx))^2 + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2 - \frac{(16bfh^2)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{75c^3} \\
&\quad - \frac{(8b^2fh^2)\int x^2\,dx}{75c^2} - \frac{(3bh(2fg+eh))\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^3} \\
&\quad - \frac{(3b^2h(2fg+eh))\int x\,dx}{16c^2} - \frac{(4b^2(fg^2+h(2eg+dh)))\int 1\,dx}{9c^2}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^2x - \frac{4b^2(fg^2 + h(2eg + dh))\,x}{9c^2} - \frac{1}{4}b^2g(eg + 2dh)x^2 - \frac{3b^2h(2fg + eh)x^2}{32c^2} \\
&\quad - \frac{8b^2fh^2x^3}{225c^2} - \frac{2}{27}b^2\left(fg^2 + h(2eg + dh)\right)x^3 - \frac{1}{32}b^2h(2fg + eh)x^4 - \frac{2}{125}b^2fh^2x^5 \\
&\quad + \frac{2bdg^2\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{c} + \frac{16bfh^2\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4b(fg^2 + h(2eg + dh))\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{9c^3} \\
&\quad + \frac{bg(eg + 2dh)x\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(2fg + eh)x\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{16c^3} \\
&\quad + \frac{8bfh^2x^2\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2b(fg^2 + h(2eg + dh))\,x^2\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{9c} \\
&\quad + \frac{bh(2fg + eh)x^3\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{8c} \\
&\quad + \frac{2bfh^2x^4\sqrt{1 - c^2x^2}(a + b\arcsin(cx))}{25c} - \frac{g(eg + 2dh)(a + b\arcsin(cx))^2}{4c^2} \\
&\quad - \frac{3h(2fg + eh)(a + b\arcsin(cx))^2}{32c^4} + dg^2x(a + b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}g(eg + 2dh)x^2(a + b\arcsin(cx))^2 + \frac{1}{3}\left(fg^2 + h(2eg + dh)\right)x^3(a + b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h(2fg + eh)x^4(a + b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a + b\arcsin(cx))^2 - \frac{(16b^2fh^2)\int 1\,dx}{75c^4}
\end{aligned}
$$

$$
\begin{aligned}
&= -2b^2dg^2x - \frac{16b^2fh^2x}{75c^4} - \frac{4b^2(fg^2+h(2eg+dh))\,x}{9c^2} \\
&\quad - \frac{1}{4}b^2g(eg+2dh)x^2 - \frac{3b^2h(2fg+eh)x^2}{32c^2} - \frac{8b^2fh^2x^3}{225c^2} \\
&\quad - \frac{2}{27}b^2\left(fg^2+h(2eg+dh)\right)x^3 - \frac{1}{32}b^2h(2fg+eh)x^4 - \frac{2}{125}b^2fh^2x^5 \\
&\quad + \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4b(fg^2+h(2eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(2fg+eh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} \\
&\quad + \frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2b(fg^2+h(2eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad + \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} - \frac{g(eg+2dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad - \frac{3h(2fg+eh)(a+b\arcsin(cx))^2}{32c^4} + dg^2x(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 534, normalized size of antiderivative = 0.76

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = dg^2x(a+b\arcsin(cx))^2 + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2 - \frac{2b(fg^2+h(2eg+dh))\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3} - \frac{2bfh^2\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)\arcsin(cx)\right)}{1125c^5} - 2bdg^2\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right) - \frac{1}{32}bh(2fg+eh)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3} - \frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right) - \frac{1}{4}bg(eg+2dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

```
[In] Integrate[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*g^2*x*(a + b*ArcSin[c*x])^2 + (g*(e*g + 2*d*h)*x^2*(a + b*ArcSin[c*x])^2)
/2 + ((f*g^2 + h*(2*e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(2*f*g +
e*h)*x^4*(a + b*ArcSin[c*x])^2)/4 + (f*h^2*x^5*(a + b*ArcSin[c*x])^2)/5 - (
2*b*(f*g^2 + h*(2*e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x
*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3)
 - (2*b*f*h^2*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + b*c*x*
(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*
c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - 2*b*d*g^2*(b*x - (Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/c) - (b*h*(2*f*g + e*h)*((3*b*x^2)/c^2 + b*x^4 - (6*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4)))/32 - (b*g*(e*g + 2*d*h
)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[c*
x])^2/(b*c^2)))/4
```

Maple [A] (verified)

Time = 2.19 (sec) , antiderivative size = 1194, normalized size of antiderivative = 1.70

method	result	size
derivativedivides	Expression too large to display	1194
default	Expression too large to display	1194
parts	Expression too large to display	1278

```
[In] int((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^4*(1/5*f*h^2*c^5*x^5+1/4*(c*e*h^2+2*c*f*g*h)*c^4*x^4+1/3*(c^2*d*
h^2+2*c^2*e*g*h+c^2*f*g^2)*c^3*x^3+1/2*(2*c^3*d*g*h+c^3*e*g^2)*c^2*x^2+g^2*
c^5*d*x)+b^2/c^4*(c^4*d*g^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^
2+1)^(1/2))+1/4*c^3*g^2*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arc
sin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/27*c^2*f*g^2*(9*c^3*x^3*arcsin(c*x)^2
+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)-12*c*x)+1/2*c^3*g*h*d*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1
/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+2/27*c^2*e*g*h*(9*c^3*x^3*arcsin
(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)-12*c*x)+1/64*c*f*g*h*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x
^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/27*c^2*d*h^2*(9*c^3*x^3*arcsin(c*x)^2
+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)-12*c*x)+1/128*c*e*h^2*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-1
2*arcsin(c*x)^2-12*c^2*x^2-9)+1/1125*f*h^2*(225*arcsin(c*x)^2*c^5*x^5+90*(-
c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-c^2*x^2+1)^(1/2)*arcs
in(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-240*c*x))+2*a
*b/c^4*(1/5*arcsin(c*x)*f*h^2*c^5*x^5+1/4*arcsin(c*x)*c^5*e*h^2*x^4+1/2*arc
sin(c*x)*c^5*f*g*h*x^4+1/3*arcsin(c*x)*c^5*d*h^2*x^3+2/3*arcsin(c*x)*c^5*e*
g*h*x^3+1/3*arcsin(c*x)*c^5*f*g^2*x^3+arcsin(c*x)*c^5*d*g*h*x^2+1/2*arcsin(
c*x)*c^5*e*g^2*x^2+arcsin(c*x)*g^2*c^5*d*x-1/5*f*h^2*(-1/5*c^4*x^4*(-c^2*x^
2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+g^2*c^4
*d*(-c^2*x^2+1)^(1/2)-1/60*(15*c*e*h^2+30*c*f*g*h)*(-1/4*c^3*x^3*(-c^2*x^2+
1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/60*(60*c^3*d*g*h+30*
c^3*e*g^2)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-1/60*(20*c^2*d*h^2
+40*c^2*e*g*h+20*c^2*f*g^2)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+
1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 1029, normalized size of antiderivative = 1.47

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \frac{864\,(25\,a^2-2\,b^2)c^5fh^2x^5+3375\,(2\,(8\,a^2-b^2)c^5fgh+(8\,a^2-b^2)c^5eh^2)x^4+160\,(25\,(9\,a^2-2\,b^2)c^5fg^2+5}{}$$

```
[In] integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas"
)
```

```
[Out] 1/108000*(864*(25*a^2 - 2*b^2)*c^5*f*h^2*x^5 + 3375*(2*(8*a^2 - b^2)*c^5*f*
g*h + (8*a^2 - b^2)*c^5*e*h^2)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^5*f*g^2 + 50
*(9*a^2 - 2*b^2)*c^5*e*g*h + (25*(9*a^2 - 2*b^2)*c^5*d - 24*b^2*c^3*f)*h^2)
*x^3 + 3375*(8*(2*a^2 - b^2)*c^5*e*g^2 - 3*b^2*c^3*e*h^2 + 2*(8*(2*a^2 - b^
2)*c^5*d - 3*b^2*c^3*f)*g*h)*x^2 + 225*(96*b^2*c^5*f*h^2*x^5 + 480*b^2*c^5*
d*g^2*x - 120*b^2*c^3*e*g^2 - 45*b^2*c*e*h^2 + 120*(2*b^2*c^5*f*g*h + b^2*c
^5*e*h^2)*x^4 + 160*(b^2*c^5*f*g^2 + 2*b^2*c^5*e*g*h + b^2*c^5*d*h^2)*x^3 -
 30*(8*b^2*c^3*d + 3*b^2*c*f)*g*h + 240*(b^2*c^5*e*g^2 + 2*b^2*c^5*d*g*h)*x
^2)*arcsin(c*x)^2 - 480*(200*b^2*c^3*e*g*h - 25*(9*(a^2 - 2*b^2)*c^5*d - 4*
b^2*c^3*f)*g^2 + 4*(25*b^2*c^3*d + 12*b^2*c*f)*h^2)*x + 450*(96*a*b*c^5*f*h
^2*x^5 + 480*a*b*c^5*d*g^2*x - 120*a*b*c^3*e*g^2 - 45*a*b*c*e*h^2 + 120*(2*
a*b*c^5*f*g*h + a*b*c^5*e*h^2)*x^4 + 160*(a*b*c^5*f*g^2 + 2*a*b*c^5*e*g*h +
 a*b*c^5*d*h^2)*x^3 - 30*(8*a*b*c^3*d + 3*a*b*c*f)*g*h + 240*(a*b*c^5*e*g^2
 + 2*a*b*c^5*d*g*h)*x^2)*arcsin(c*x) + 30*(288*a*b*c^4*f*h^2*x^4 + 3200*a*b
*c^2*e*g*h + 450*(2*a*b*c^4*f*g*h + a*b*c^4*e*h^2)*x^3 + 800*(9*a*b*c^4*d +
 2*a*b*c^2*f)*g^2 + 64*(25*a*b*c^2*d + 12*a*b*f)*h^2 + 32*(25*a*b*c^4*f*g^2
 + 50*a*b*c^4*e*g*h + (25*a*b*c^4*d + 12*a*b*c^2*f)*h^2)*x^2 + 225*(8*a*b*c
^4*e*g^2 + 3*a*b*c^2*e*h^2 + 2*(8*a*b*c^4*d + 3*a*b*c^2*f)*g*h)*x + (288*b^
2*c^4*f*h^2*x^4 + 3200*b^2*c^2*e*g*h + 450*(2*b^2*c^4*f*g*h + b^2*c^4*e*h^2
)*x^3 + 800*(9*b^2*c^4*d + 2*b^2*c^2*f)*g^2 + 64*(25*b^2*c^2*d + 12*b^2*f)*
h^2 + 32*(25*b^2*c^4*f*g^2 + 50*b^2*c^4*e*g*h + (25*b^2*c^4*d + 12*b^2*c^2*
f)*h^2)*x^2 + 225*(8*b^2*c^4*e*g^2 + 3*b^2*c^2*e*h^2 + 2*(8*b^2*c^4*d + 3*b
^2*c^2*f)*g*h)*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1935 vs. 2(694) = 1388.

Time = 0.78 (sec) , antiderivative size = 1935, normalized size of antiderivative = 2.76

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)**2*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*g**2*x + a**2*d*g*h*x**2 + a**2*d*h**2*x**3/3 + a**2*e*g*
*2*x**2/2 + 2*a**2*e*g*h*x**3/3 + a**2*e*h**2*x**4/4 + a**2*f*g**2*x**3/3 +
 a**2*f*g*h*x**4/2 + a**2*f*h**2*x**5/5 + 2*a*b*d*g**2*x*asin(c*x) + 2*a*b*
d*g*h*x**2*asin(c*x) + 2*a*b*d*h**2*x**3*asin(c*x)/3 + a*b*e*g**2*x**2*asin
(c*x) + 4*a*b*e*g*h*x**3*asin(c*x)/3 + a*b*e*h**2*x**4*asin(c*x)/2 + 2*a*b*
f*g**2*x**3*asin(c*x)/3 + a*b*f*g*h*x**4*asin(c*x) + 2*a*b*f*h**2*x**5*asin
(c*x)/5 + 2*a*b*d*g**2*sqrt(-c**2*x**2 + 1)/c + a*b*d*g*h*x*sqrt(-c**2*x**2
 + 1)/c + 2*a*b*d*h**2*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*e*g**2*x*sqrt(
-c**2*x**2 + 1)/(2*c) + 4*a*b*e*g*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*e
*h**2*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + 2*a*b*f*g**2*x**2*sqrt(-c**2*x**2 +
 1)/(9*c) + a*b*f*g*h*x**3*sqrt(-c**2*x**2 + 1)/(4*c) + 2*a*b*f*h**2*x**4*s
qrt(-c**2*x**2 + 1)/(25*c) - a*b*d*g*h*asin(c*x)/c**2 - a*b*e*g**2*asin(c*x
)/(2*c**2) + 4*a*b*d*h**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*a*b*e*g*h*sqrt(
-c**2*x**2 + 1)/(9*c**3) + 3*a*b*e*h**2*x*sqrt(-c**2*x**2 + 1)/(16*c**3) +
4*a*b*f*g**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*g*h*x*sqrt(-c**2*x**2
+ 1)/(8*c**3) + 8*a*b*f*h**2*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 3*a*b*e*
h**2*asin(c*x)/(16*c**4) - 3*a*b*f*g*h*asin(c*x)/(8*c**4) + 16*a*b*f*h**2*s
qrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d*g**2*x*asin(c*x)**2 - 2*b**2*d*g**2*
x + b**2*d*g*h*x**2*asin(c*x)**2 - b**2*d*g*h*x**2/2 + b**2*d*h**2*x**3*asi
n(c*x)**2/3 - 2*b**2*d*h**2*x**3/27 + b**2*e*g**2*x**2*asin(c*x)**2/2 - b**
2*e*g**2*x**2/4 + 2*b**2*e*g*h*x**3*asin(c*x)**2/3 - 4*b**2*e*g*h*x**3/27 +
 b**2*e*h**2*x**4*asin(c*x)**2/4 - b**2*e*h**2*x**4/32 + b**2*f*g**2*x**3*a
sin(c*x)**2/3 - 2*b**2*f*g**2*x**3/27 + b**2*f*g*h*x**4*asin(c*x)**2/2 - b*
*2*f*g*h*x**4/16 + b**2*f*h**2*x**5*asin(c*x)**2/5 - 2*b**2*f*h**2*x**5/125
 + 2*b**2*d*g**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + b**2*d*g*h*x*sqrt(-c**2
*x**2 + 1)*asin(c*x)/c + 2*b**2*d*h**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/
(9*c) + b**2*e*g**2*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 4*b**2*e*g*h*x
**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + b**2*e*h**2*x**3*sqrt(-c**2*x**2
 + 1)*asin(c*x)/(8*c) + 2*b**2*f*g**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
9*c) + b**2*f*g*h*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(4*c) + 2*b**2*f*h**2
*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) - b**2*d*g*h*asin(c*x)**2/(2*c*
*2) - 4*b**2*d*h**2*x/(9*c**2) - b**2*e*g**2*asin(c*x)**2/(4*c**2) - 8*b**2
*e*g*h*x/(9*c**2) - 3*b**2*e*h**2*x**2/(32*c**2) - 4*b**2*f*g**2*x/(9*c**2)
 - 3*b**2*f*g*h*x**2/(16*c**2) - 8*b**2*f*h**2*x**3/(225*c**2) + 4*b**2*d*h
**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3) + 8*b**2*e*g*h*sqrt(-c**2*x**2
```

```
+ 1)*asin(c*x)/(9*c**3) + 3*b**2*e*h**2*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(1
6*c**3) + 4*b**2*f*g**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3) + 3*b**2*f*
g*h*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*c**3) + 8*b**2*f*h**2*x**2*sqrt(-c*
*2*x**2 + 1)*asin(c*x)/(75*c**3) - 3*b**2*e*h**2*asin(c*x)**2/(32*c**4) - 3
*b**2*f*g*h*asin(c*x)**2/(16*c**4) - 16*b**2*f*h**2*x/(75*c**4) + 16*b**2*f
*h**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**5), Ne(c, 0)), (a**2*(d*g**2*x
+ d*g*h*x**2 + d*h**2*x**3/3 + e*g**2*x**2/2 + 2*e*g*h*x**3/3 + e*h**2*x**4
/4 + f*g**2*x**3/3 + f*g*h*x**4/2 + f*h**2*x**5/5), True))
```

Maxima [F]

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\int \left(fx^2+ex+d\right)(hx+g)^2(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima"
)
```

```
[Out] 1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*x
^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 + 1/
2*a^2*e*g^2*x^2 + a^2*d*g*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g^2 + 2/9*(3*x^3*arcsin(c*x) + c*(sqr
t(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^2 + (2*x^2*arc
sin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g*h + 4/9*
(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c
^4))*a*b*e*g*h + 1/8*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3
*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g*h + 2/9*(3*x^3*ar
csin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*
d*h^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c
^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*h^2 + 2/75*(15*x^5*arcsin(c
*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt
(-c^2*x^2 + 1)/c^6)*c)*a*b*f*h^2 - 2*b^2*d*g^2*(x - sqrt(-c^2*x^2 + 1)*arcs
in(c*x)/c) + a^2*d*g^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d*g
^2/c + 1/60*(12*b^2*f*h^2*x^5 + 15*(2*b^2*f*g*h + b^2*e*h^2)*x^4 + 20*(b^2*
f*g^2 + 2*b^2*e*g*h + b^2*d*h^2)*x^3 + 30*(b^2*e*g^2 + 2*b^2*d*g*h)*x^2)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/30*(12*b^2*c*f*h^2
*x^5 + 15*(2*b^2*c*f*g*h + b^2*c*e*h^2)*x^4 + 20*(b^2*c*f*g^2 + 2*b^2*c*e*g
*h + b^2*c*d*h^2)*x^3 + 30*(b^2*c*e*g^2 + 2*b^2*c*d*g*h)*x^2)*sqrt(c*x + 1)
*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x
)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2166 vs. 2(639) = 1278.

Time = 0.35 (sec) , antiderivative size = 2166, normalized size of antiderivative = 3.09

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*x
^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 + 2*
a*b*d*g^2*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^2*x*arcsin(c*x)^2/c^2 +
 2/3*(c^2*x^2 - 1)*b^2*e*g*h*x*arcsin(c*x)^2/c^2 + 1/3*(c^2*x^2 - 1)*b^2*d*
h^2*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^2*x*arcsin(c*x)/c
+ sqrt(-c^2*x^2 + 1)*b^2*d*g*h*x*arcsin(c*x)/c + a^2*d*g^2*x - 2*b^2*d*g^2*
x + 2/3*(c^2*x^2 - 1)*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*(c^2*x^2 - 1)*a*b*e
*g*h*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*a*b*d*h^2*x*arcsin(c*x)/c^2 + 1/
2*(c^2*x^2 - 1)*b^2*e*g^2*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*g*h*arcsi
n(c*x)^2/c^2 + 1/3*b^2*f*g^2*x*arcsin(c*x)^2/c^2 + 2/3*b^2*e*g*h*x*arcsin(c
*x)^2/c^2 + 1/3*b^2*d*h^2*x*arcsin(c*x)^2/c^2 + 1/5*(c^2*x^2 - 1)^2*b^2*f*h
^2*x*arcsin(c*x)^2/c^4 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*g^2*x/c + sqrt(-c^2*x
^2 + 1)*a*b*d*g*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g^2*arcsin(c*x)/c - 1/4*
(-c^2*x^2 + 1)^(3/2)*b^2*f*g*h*x*arcsin(c*x)/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)
*b^2*e*h^2*x*arcsin(c*x)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g^2*x/c^2 - 4/27*(c
^2*x^2 - 1)*b^2*e*g*h*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*d*h^2*x/c^2 + (c^2*x^2
 - 1)*a*b*e*g^2*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*h*arcsin(c*x)/c^2
 + 2/3*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*a*b*e*g*h*x*arcsin(c*x)/c^2 + 2/3*
a*b*d*h^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*a*b*f*h^2*x*arcsin(c*x)/c
^4 + 1/4*b^2*e*g^2*arcsin(c*x)^2/c^2 + 1/2*b^2*d*g*h*arcsin(c*x)^2/c^2 + 1/
2*(c^2*x^2 - 1)^2*b^2*f*g*h*arcsin(c*x)^2/c^4 + 1/4*(c^2*x^2 - 1)^2*b^2*e*h
^2*arcsin(c*x)^2/c^4 + 2/5*(c^2*x^2 - 1)*b^2*f*h^2*x*arcsin(c*x)^2/c^4 + 2*
sqrt(-c^2*x^2 + 1)*a*b*d*g^2/c - 1/4*(-c^2*x^2 + 1)^(3/2)*a*b*f*g*h*x/c^3 -
 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*e*h^2*x/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*f*
g^2*arcsin(c*x)/c^3 - 4/9*(-c^2*x^2 + 1)^(3/2)*b^2*e*g*h*arcsin(c*x)/c^3 -
2/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*h^2*arcsin(c*x)/c^3 + 5/8*sqrt(-c^2*x^2 + 1)
*b^2*f*g*h*x*arcsin(c*x)/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*b^2*e*h^2*x*arcsin(c
*x)/c^3 + 1/2*(c^2*x^2 - 1)*a^2*e*g^2/c^2 - 1/4*(c^2*x^2 - 1)*b^2*e*g^2/c^2
 + (c^2*x^2 - 1)*a^2*d*g*h/c^2 - 1/2*(c^2*x^2 - 1)*b^2*d*g*h/c^2 - 14/27*b^
2*f*g^2*x/c^2 - 28/27*b^2*e*g*h*x/c^2 - 14/27*b^2*d*h^2*x/c^2 - 2/125*(c^2*
x^2 - 1)^2*b^2*f*h^2*x/c^4 + 1/2*a*b*e*g^2*arcsin(c*x)/c^2 + a*b*d*g*h*arcs
in(c*x)/c^2 + (c^2*x^2 - 1)^2*a*b*f*g*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)
^2*a*b*e*h^2*arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*a*b*f*h^2*x*arcsin(c*x)/c^
4 + (c^2*x^2 - 1)*b^2*f*g*h*arcsin(c*x)^2/c^4 + 1/2*(c^2*x^2 - 1)*b^2*e*h^2
*arcsin(c*x)^2/c^4 + 1/5*b^2*f*h^2*x*arcsin(c*x)^2/c^4 - 2/9*(-c^2*x^2 + 1)
```

```
^(3/2)*a*b*f*g^2/c^3 - 4/9*(-c^2*x^2 + 1)^(3/2)*a*b*e*g*h/c^3 - 2/9*(-c^2*x
^2 + 1)^(3/2)*a*b*d*h^2/c^3 + 5/8*sqrt(-c^2*x^2 + 1)*a*b*f*g*h*x/c^3 + 5/16
*sqrt(-c^2*x^2 + 1)*a*b*e*h^2*x/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b^2*f*g^2*arcs
in(c*x)/c^3 + 4/3*sqrt(-c^2*x^2 + 1)*b^2*e*g*h*arcsin(c*x)/c^3 + 2/3*sqrt(-
c^2*x^2 + 1)*b^2*d*h^2*arcsin(c*x)/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
 + 1)*b^2*f*h^2*arcsin(c*x)/c^5 - 1/8*b^2*e*g^2/c^2 - 1/4*b^2*d*g*h/c^2 - 1
/16*(c^2*x^2 - 1)^2*b^2*f*g*h/c^4 - 1/32*(c^2*x^2 - 1)^2*b^2*e*h^2/c^4 - 76
/1125*(c^2*x^2 - 1)*b^2*f*h^2*x/c^4 + 2*(c^2*x^2 - 1)*a*b*f*g*h*arcsin(c*x)
/c^4 + (c^2*x^2 - 1)*a*b*e*h^2*arcsin(c*x)/c^4 + 2/5*a*b*f*h^2*x*arcsin(c*x
)/c^4 + 5/16*b^2*f*g*h*arcsin(c*x)^2/c^4 + 5/32*b^2*e*h^2*arcsin(c*x)^2/c^4
 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*f*g^2/c^3 + 4/3*sqrt(-c^2*x^2 + 1)*a*b*e*g*h/
c^3 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*d*h^2/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2
*x^2 + 1)*a*b*f*h^2/c^5 - 4/15*(-c^2*x^2 + 1)^(3/2)*b^2*f*h^2*arcsin(c*x)/c
^5 - 5/16*(c^2*x^2 - 1)*b^2*f*g*h/c^4 - 5/32*(c^2*x^2 - 1)*b^2*e*h^2/c^4 -
298/1125*b^2*f*h^2*x/c^4 + 5/8*a*b*f*g*h*arcsin(c*x)/c^4 + 5/16*a*b*e*h^2*a
rcsin(c*x)/c^4 - 4/15*(-c^2*x^2 + 1)^(3/2)*a*b*f*h^2/c^5 + 2/5*sqrt(-c^2*x^
2 + 1)*b^2*f*h^2*arcsin(c*x)/c^5 - 17/128*b^2*f*g*h/c^4 - 17/256*b^2*e*h^2/
c^4 + 2/5*sqrt(-c^2*x^2 + 1)*a*b*f*h^2/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx$$
$$=\int (g+h\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

```
[In] int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
[Out] int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

3.117 $\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 425

$$\begin{aligned}
&\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx\\
&= -2b^2dgx-\frac{4b^2(fg+eh)x}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2(eg+dh)x^2-\frac{2}{27}b^2(fg+eh)x^3-\frac{1}{32}b^2fhx^4\\
&\quad+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{4b(fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}\\
&\quad+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\
&\quad+\frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\
&\quad-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}-\frac{(eg+dh)(a+b\arcsin(cx))^2}{4c^2}\\
&\quad+dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2
\end{aligned}$$

```
[Out] -2*b^2*d*g*x-4/9*b^2*(e*h+f*g)*x/c^2-3/32*b^2*f*h*x^2/c^2-1/4*b^2*(d*h+e*g)
*x^2-2/27*b^2*(e*h+f*g)*x^3-1/32*b^2*f*h*x^4-3/32*f*h*(a+b*arcsin(c*x))^2/c
^4-1/4*(d*h+e*g)*(a+b*arcsin(c*x))^2/c^2+d*g*x*(a+b*arcsin(c*x))^2+1/2*(d*h
+e*g)*x^2*(a+b*arcsin(c*x))^2+1/3*(e*h+f*g)*x^3*(a+b*arcsin(c*x))^2+1/4*f*h
*x^4*(a+b*arcsin(c*x))^2+2*b*d*g*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/9
*b*(e*h+f*g)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+3/16*b*f*h*x*(a+b*arc
sin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/2*b*(d*h+e*g)*x*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)/c+2/9*b*(e*h+f*g)*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+1
/8*b*f*h*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4835, 4715, 4767, 8, 4723, 4795, 4737, 30}

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}+\frac{bx\sqrt{1-c^2x^2}(dh+eg)(a+b\arcsin(cx))}{2c}-\frac{(dh+eg)(a+b\arcsin(cx))^2}{4c^2}+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{2bx^2\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}+\frac{4b\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c^3}+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{1}{2}x^2(dh+eg)(a+b\arcsin(cx))^2+dgx(a+b\arcsin(cx))^2+\frac{1}{3}x^3(eh+fg)(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2-\frac{4b^2x(eh+fg)}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2x^2(dh+eg)-2b^2dgx-\frac{2}{27}b^2x^3(eh+fg)-\frac{1}{32}b^2fhx^4$$

```
[In] Int[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*g*x - (4*b^2*(f*g + e*h)*x)/(9*c^2) - (3*b^2*f*h*x^2)/(32*c^2) - (
b^2*(e*g + d*h)*x^2)/4 - (2*b^2*(f*g + e*h)*x^3)/27 - (b^2*f*h*x^4)/32 + (2
*b*d*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (4*b*(f*g + e*h)*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (3*b*f*h*x*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/(16*c^3) + (b*(e*g + d*h)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(2*c) + (2*b*(f*g + e*h)*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/(9*c) + (b*f*h*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) - (3*f*h*(
a + b*ArcSin[c*x])^2)/(32*c^4) - ((e*g + d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2
) + d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c*x])^2)/2
 + ((f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*ArcSin[c*x])
^2)/4
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4835

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(dg(a+b\arcsin(cx))^2+(eg+dh)x(a+b\arcsin(cx))^2 \right.\\
&\quad \left. +(fg+eh)x^2(a+b\arcsin(cx))^2+fhx^3(a+b\arcsin(cx))^2\right)\,dx\\
&=(dg)\int(a+b\arcsin(cx))^2\,dx+(fh)\int x^3(a+b\arcsin(cx))^2\,dx\\
&\quad+(eg+dh)\int x(a+b\arcsin(cx))^2\,dx+(fg+eh)\int x^2(a+b\arcsin(cx))^2\,dx\\
&=dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2\\
&\quad-(2bcdg)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}(bcfh)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&\quad-(bc(eg+dh))\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&\quad-\frac{1}{3}(2bc(fg+eh))\int\frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&=\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\
&\quad+\frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\
&\quad+dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2\\
&\quad-\left(2b^2dg\right)\int 1\,dx-\frac{1}{8}\left(b^2fh\right)\int x^3\,dx-\frac{(3bfh)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c}\\
&\quad-\frac{1}{2}\left(b^2(eg+dh)\right)\int x\,dx-\frac{(b(eg+dh))\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c}\\
&\quad-\frac{1}{9}\left(2b^2(fg+eh)\right)\int x^2\,dx-\frac{(4b(fg+eh))\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c}
\end{aligned}$$

$$
\begin{aligned}
&= -2b^2dgx - \frac{1}{4}b^2(eg+dh)x^2 - \frac{2}{27}b^2(fg+eh)x^3 - \frac{1}{32}b^2fhx^4 \\
&\quad + \frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4b(fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} + \frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} - \frac{(eg+dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad + dgx(a+b\arcsin(cx))^2 + \frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2 + \frac{1}{4}fhx^4(a+b\arcsin(cx))^2 \\
&\quad - \frac{(3bfh)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^3} - \frac{(3b^2fh)\int x\,dx}{16c^2} - \frac{(4b^2(fg+eh))\int 1\,dx}{9c^2} \\
&= -2b^2dgx - \frac{4b^2(fg+eh)x}{9c^2} - \frac{3b^2fhx^2}{32c^2} - \frac{1}{4}b^2(eg+dh)x^2 - \frac{2}{27}b^2(fg+eh)x^3 - \frac{1}{32}b^2fhx^4 \\
&\quad + \frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4b(fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} + \frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad - \frac{3fh(a+b\arcsin(cx))^2}{32c^4} - \frac{(eg+dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad + dgx(a+b\arcsin(cx))^2 + \frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2 + \frac{1}{4}fhx^4(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 364, normalized size of antiderivative = 0.86

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2$$
$$+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2$$
$$-\frac{2b(fg+eh)\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3}$$
$$-2bdg\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$
$$-\frac{1}{32}bfh\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right)$$
$$-\frac{1}{4}b(eg+dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

```
[In] Integrate[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 + (
(f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*ArcSin[c*x])^2)/
4 - (2*b*(f*g + e*h)*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2
*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3) - 2*b*d*
g*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*f*h*((3*b*x^2)/c^2
 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4)))/32
- (b*(e*g + d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (
a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

Maple [A] (verified)

Time = 2.00 (sec) , antiderivative size = 679, normalized size of antiderivative = 1.60

method	result
parts	$a^2\left(\frac{hf\,x^4}{4}+\frac{(eh+fg)x^3}{3}+\frac{(dh+eg)x^2}{2}+dgx\right)+\frac{b^2\left(\frac{hf\left(32\arcsin(cx)^2x^4c^4+16\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3x^3-4c^4x^4+\right.}{128c^3}\right.}{}$
derivativedivides	$\frac{a^2\left(\frac{hf\,c^4x^4}{4}+\frac{(ech+cfg)c^3x^3}{3}+\frac{\left(d\,c^2h+e\,c^2g\right)c^2x^2}{2}+g\,c^4dx\right)}{c^3}+\frac{b^2\left(c^3dg\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^2eg\left(2\,\mathrm{ar}\right.}{}\right.}{}$
default	$\frac{a^2\left(\frac{hf\,c^4x^4}{4}+\frac{(ech+cfg)c^3x^3}{3}+\frac{\left(d\,c^2h+e\,c^2g\right)c^2x^2}{2}+g\,c^4dx\right)}{c^3}+\frac{b^2\left(c^3dg\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^2eg\left(2\,\mathrm{ar}\right.}{}\right.}{}$

```
[In] int((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(1/4*h*f*x^4+1/3*(e*h+f*g)*x^3+1/2*(d*h+e*g)*x^2+d*g*x)+b^2/c*(1/128*h*
f*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4
*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)/c
^3+1/27*h*e*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c
^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/4*h*d*(2*arcsi
n(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2
)/c+1/27*g*f*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*
c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/4*g*e*(2*arcs
in(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^
2)/c+d*g*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/
c*(1/4*c*arcsin(c*x)*h*f*x^4+1/3*c*arcsin(c*x)*e*h*x^3+1/3*c*arcsin(c*x)*x^
3*f*g+1/2*c*arcsin(c*x)*x^2*d*h+1/2*c*arcsin(c*x)*e*g*x^2+c*arcsin(c*x)*x*d
*g-1/12/c^3*(3*h*f*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1
/2)+3/8*arcsin(c*x))-12*g*c^3*d*(-c^2*x^2+1)^(1/2)+(4*c*e*h+4*c*f*g)*(-1/3*
c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(6*c^2*d*h+6*c^2*e*g)*(-
1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 579, normalized size of antiderivative = 1.36

$$\int(g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\frac{27\left(8\,a^2-b^2\right)c^4fhx^4+32\left(\left(9\,a^2-2\,b^2\right)c^4fg+\left(9\,a^2-2\,b^2\right)c^4eh\right)x^3+27\left(8\left(2\,a^2-b^2\right)c^4eg+\left(8\left(2\,a^2-b^2\right)\right.\right.}{}$$

```
[In] integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/864*(27*(8*a^2 - b^2)*c^4*f*h*x^4 + 32*((9*a^2 - 2*b^2)*c^4*f*g + (9*a^2
- 2*b^2)*c^4*e*h)*x^3 + 27*(8*(2*a^2 - b^2)*c^4*e*g + (8*(2*a^2 - b^2)*c^4*
```

```
d - 3*b^2*c^2*f)*h)*x^2 + 9*(24*b^2*c^4*f*h*x^4 + 96*b^2*c^4*d*g*x - 24*b^2
*c^2*e*g + 32*(b^2*c^4*f*g + b^2*c^4*e*h)*x^3 + 48*(b^2*c^4*e*g + b^2*c^4*d
*h)*x^2 - 3*(8*b^2*c^2*d + 3*b^2*f)*h)*arcsin(c*x)^2 - 96*(4*b^2*c^2*e*h -
(9*(a^2 - 2*b^2)*c^4*d - 4*b^2*c^2*f)*g)*x + 18*(24*a*b*c^4*f*h*x^4 + 96*a*
b*c^4*d*g*x - 24*a*b*c^2*e*g + 32*(a*b*c^4*f*g + a*b*c^4*e*h)*x^3 + 48*(a*b
*c^4*e*g + a*b*c^4*d*h)*x^2 - 3*(8*a*b*c^2*d + 3*a*b*f)*h)*arcsin(c*x) + 6*
(18*a*b*c^3*f*h*x^3 + 64*a*b*c*e*h + 32*(a*b*c^3*f*g + a*b*c^3*e*h)*x^2 + 3
2*(9*a*b*c^3*d + 2*a*b*c*f)*g + 9*(8*a*b*c^3*e*g + (8*a*b*c^3*d + 3*a*b*c*f
)*h)*x + (18*b^2*c^3*f*h*x^3 + 64*b^2*c*e*h + 32*(b^2*c^3*f*g + b^2*c^3*e*h
)*x^2 + 32*(9*b^2*c^3*d + 2*b^2*c*f)*g + 9*(8*b^2*c^3*e*g + (8*b^2*c^3*d +
3*b^2*c*f)*h)*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. 2(416) = 832.

Time = 0.51 (sec) , antiderivative size = 1059, normalized size of antiderivative = 2.49

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*g*x + a**2*d*h*x**2/2 + a**2*e*g*x**2/2 + a**2*e*h*x**3/3
 + a**2*f*g*x**3/3 + a**2*f*h*x**4/4 + 2*a*b*d*g*x*asin(c*x) + a*b*d*h*x**2
*asin(c*x) + a*b*e*g*x**2*asin(c*x) + 2*a*b*e*h*x**3*asin(c*x)/3 + 2*a*b*f*
g*x**3*asin(c*x)/3 + a*b*f*h*x**4*asin(c*x)/2 + 2*a*b*d*g*sqrt(-c**2*x**2 +
 1)/c + a*b*d*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + a*b*e*g*x*sqrt(-c**2*x**2 +
1)/(2*c) + 2*a*b*e*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*a*b*f*g*x**2*sqrt(
-c**2*x**2 + 1)/(9*c) + a*b*f*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) - a*b*d*h*a
sin(c*x)/(2*c**2) - a*b*e*g*asin(c*x)/(2*c**2) + 4*a*b*e*h*sqrt(-c**2*x**2
+ 1)/(9*c**3) + 4*a*b*f*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*h*x*sqrt(
-c**2*x**2 + 1)/(16*c**3) - 3*a*b*f*h*asin(c*x)/(16*c**4) + b**2*d*g*x*asin
(c*x)**2 - 2*b**2*d*g*x + b**2*d*h*x**2*asin(c*x)**2/2 - b**2*d*h*x**2/4 +
b**2*e*g*x**2*asin(c*x)**2/2 - b**2*e*g*x**2/4 + b**2*e*h*x**3*asin(c*x)**2
/3 - 2*b**2*e*h*x**3/27 + b**2*f*g*x**3*asin(c*x)**2/3 - 2*b**2*f*g*x**3/27
 + b**2*f*h*x**4*asin(c*x)**2/4 - b**2*f*h*x**4/32 + 2*b**2*d*g*sqrt(-c**2*
x**2 + 1)*asin(c*x)/c + b**2*d*h*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + b
**2*e*g*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 2*b**2*e*h*x**2*sqrt(-c**2
*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*f*g*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)
/(9*c) + b**2*f*h*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*c) - b**2*d*h*asin
(c*x)**2/(4*c**2) - b**2*e*g*asin(c*x)**2/(4*c**2) - 4*b**2*e*h*x/(9*c**2)
- 4*b**2*f*g*x/(9*c**2) - 3*b**2*f*h*x**2/(32*c**2) + 4*b**2*e*h*sqrt(-c**2
*x**2 + 1)*asin(c*x)/(9*c**3) + 4*b**2*f*g*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
9*c**3) + 3*b**2*f*h*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(16*c**3) - 3*b**2*f*
h*asin(c*x)**2/(32*c**4), Ne(c, 0)), (a**2*(d*g*x + d*h*x**2/2 + e*g*x**2/2
 + e*h*x**3/3 + f*g*x**3/3 + f*h*x**4/4), True))
```

Maxima [F]

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\int (fx^2+ex+d)(hx+g)(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x)
^2 + 1/2*a^2*e*g*x^2 + 1/2*a^2*d*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g + 2/9*(3*x^3*arcsin(c*x) + c
*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g + 1/2*(2*
x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*h +
 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 +
 1)/c^4))*a*b*e*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*h - 2*b^2*d*g*(
x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g*x + 2*(c*x*arcsin(c*x) + sq
rt(-c^2*x^2 + 1))*a*b*d*g/c + 1/12*(3*b^2*f*h*x^4 + 4*(b^2*f*g + b^2*e*h)*x
^3 + 6*(b^2*e*g + b^2*d*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2 + integrate(1/6*(3*b^2*c*f*h*x^4 + 4*(b^2*c*f*g + b^2*c*e*h)*x^3 + 6*(b^2
*c*e*g + b^2*c*d*h)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1145 vs. $2(383) = 766$.

Time = 0.33 (sec) , antiderivative size = 1145, normalized size of antiderivative = 2.69

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x)
^2 + 2*a*b*d*g*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g*x*arcsin(c*x)^2/c^
2 + 1/3*(c^2*x^2 - 1)*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*
b^2*e*g*x*arcsin(c*x)/c + 1/2*sqrt(-c^2*x^2 + 1)*b^2*d*h*x*arcsin(c*x)/c +
a^2*d*g*x - 2*b^2*d*g*x + 2/3*(c^2*x^2 - 1)*a*b*f*g*x*arcsin(c*x)/c^2 + 2/3
*(c^2*x^2 - 1)*a*b*e*h*x*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b^2*e*g*arcsin
(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*b^2*d*h*arcsin(c*x)^2/c^2 + 1/3*b^2*f*g*x*a
rcsin(c*x)^2/c^2 + 1/3*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)
*a*b*e*g*x/c + 1/2*sqrt(-c^2*x^2 + 1)*a*b*d*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^
2*d*g*arcsin(c*x)/c - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*f*h*x*arcsin(c*x)/c^3 -
```

```
2/27*(c^2*x^2 - 1)*b^2*f*g*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*e*h*x/c^2 + (c^2*
x^2 - 1)*a*b*e*g*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*a*b*d*h*arcsin(c*x)/c^2 +
2/3*a*b*f*g*x*arcsin(c*x)/c^2 + 2/3*a*b*e*h*x*arcsin(c*x)/c^2 + 1/4*b^2*e*g
*arcsin(c*x)^2/c^2 + 1/4*b^2*d*h*arcsin(c*x)^2/c^2 + 1/4*(c^2*x^2 - 1)^2*b^
2*f*h*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*g/c - 1/8*(-c^2*x^2 +
1)^(3/2)*a*b*f*h*x/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*arcsin(c*x)/c^3 -
 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e*h*arcsin(c*x)/c^3 + 5/16*sqrt(-c^2*x^2 + 1)
*b^2*f*h*x*arcsin(c*x)/c^3 + 1/2*(c^2*x^2 - 1)*a^2*e*g/c^2 - 1/4*(c^2*x^2 -
 1)*b^2*e*g/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d*h/c^2 - 1/4*(c^2*x^2 - 1)*b^2*d*h
/c^2 - 14/27*b^2*f*g*x/c^2 - 14/27*b^2*e*h*x/c^2 + 1/2*a*b*e*g*arcsin(c*x)/
c^2 + 1/2*a*b*d*h*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)^2*a*b*f*h*arcsin(c*x)
/c^4 + 1/2*(c^2*x^2 - 1)*b^2*f*h*arcsin(c*x)^2/c^4 - 2/9*(-c^2*x^2 + 1)^(3/
2)*a*b*f*g/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*e*h/c^3 + 5/16*sqrt(-c^2*x^2
+ 1)*a*b*f*h*x/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b^2*f*g*arcsin(c*x)/c^3 + 2/3*s
qrt(-c^2*x^2 + 1)*b^2*e*h*arcsin(c*x)/c^3 - 1/8*b^2*e*g/c^2 - 1/8*b^2*d*h/c
^2 - 1/32*(c^2*x^2 - 1)^2*b^2*f*h/c^4 + (c^2*x^2 - 1)*a*b*f*h*arcsin(c*x)/c
^4 + 5/32*b^2*f*h*arcsin(c*x)^2/c^4 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*f*g/c^3 +
2/3*sqrt(-c^2*x^2 + 1)*a*b*e*h/c^3 - 5/32*(c^2*x^2 - 1)*b^2*f*h/c^4 + 5/16*
a*b*f*h*arcsin(c*x)/c^4 - 17/256*b^2*f*h/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \int (g+h\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

```
[In] int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
[Out] int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

3.118 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 1067

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2}$$
$$- \frac{abf\arcsin(cx)}{2c^2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h}$$
$$- \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch}$$
$$- \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2}$$
$$+ \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3}$$
$$+ \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} - \frac{2iab(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2iab(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

```
[Out] b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(
c*g-(c^2*g^2-h^2)^(1/2)))/h^3+b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2*ln(1-I*
```

```
(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+a*b*f*x^2*arcsi
n(c*x)/h-b^2*(-e*h+f*g)*x*arcsin(c*x)^2/h^2+1/2*b^2*f*x*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)/c/h-1/4*b^2*f*arcsin(c*x)^2/c^2/h+1/2*b^2*f*x^2*arcsin(c*x)^2/h
+a^2*(d*h^2-e*g*h+f*g^2)*ln(h*x+g)/h^3-a^2*(-e*h+f*g)*x/h^2-1/2*a*b*f*arcsi
n(c*x)/c^2/h-2*a*b*(-e*h+f*g)*x*arcsin(c*x)/h^2+2*a*b*(d*h^2-e*g*h+f*g^2)*a
rcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h
^3+2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-1/2*a*b*(-f*h*x-4*e*h+4*f*g)*(-c^2*x^2+1)^
(1/2)/c/h^2-2*b^2*(-e*h+f*g)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/h^2-I*a*b*(d*
h^2-e*g*h+f*g^2)*arcsin(c*x)^2/h^3-2*I*a*b*(d*h^2-e*g*h+f*g^2)*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*I*b^2*(d*h^2-
e*g*h+f*g^2)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2
*g^2-h^2)^(1/2)))/h^3-2*I*a*b*(d*h^2-e*g*h+f*g^2)*polylog(2,I*(I*c*x+(-c^2*
x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*I*b^2*(d*h^2-e*g*h+f*g^2)*
arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/
2)))/h^3+2*b^2*(d*h^2-e*g*h+f*g^2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h
/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*b^2*(d*h^2-e*g*h+f*g^2)*polylog(3,I*(I*c*
x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+2*b^2*(-e*h+f*g)*x/h
^2+1/2*a^2*f*x^2/h-1/4*b^2*f*x^2/h-1/3*I*b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x
)^3/h^3
```

Rubi [A] (verified)

Time = 1.33 (sec) , antiderivative size = 1067, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.821$, Rules used = {4843, 712, 4837, 12, 6874, 794, 222, 2451, 4825, 4615, 2221, 2317, 2438, 4715, 4767,

8, 4723, 4795, 4737, 30, 2611, 2320, 6724}

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= -\frac{ib^2(fg^2-ehg+dh^2)\arcsin(cx)^3}{3h^3}+\frac{b^2fx^2\arcsin(cx)^2}{2h}$$
$$-\frac{iab(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3}-\frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2}$$
$$+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}$$
$$+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}$$
$$-\frac{b^2f\arcsin(cx)^2}{4c^2h}+\frac{abfx^2\arcsin(cx)}{h}-\frac{2ab(fg-eh)x\arcsin(cx)}{h^2}$$
$$+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}$$
$$+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}$$
$$-\frac{2ib^2(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}$$
$$-\frac{2ib^2(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}$$
$$-\frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}+\frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch}$$
$$-\frac{abf\arcsin(cx)}{2c^2h}+\frac{a^2fx^2}{2h}-\frac{b^2fx^2}{4h}-\frac{a^2(fg-eh)x}{h^2}+\frac{2b^2(fg-eh)x}{h^2}$$
$$+\frac{a^2(fg^2-ehg+dh^2)\log(g+hx)}{h^3}-\frac{2iab(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{2iab(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+\frac{2b^2(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+\frac{2b^2(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2}$$

```
[In] Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

```
[Out] -((a^2*(f*g - e*h)*x)/h^2) + (2*b^2*(f*g - e*h)*x)/h^2 + (a^2*f*x^2)/(2*h)
- (b^2*f*x^2)/(4*h) - (a*b*(4*(f*g - e*h) - f*h*x)*Sqrt[1 - c^2*x^2])/(2*c*
```

```
h^2) - (a*b*f*ArcSin[c*x])/(2*c^2*h) - (2*a*b*(f*g - e*h)*x*ArcSin[c*x])/h^
2 + (a*b*f*x^2*ArcSin[c*x])/h - (2*b^2*(f*g - e*h)*Sqrt[1 - c^2*x^2]*ArcSin
[c*x])/(c*h^2) + (b^2*f*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(2*c*h) - (b^2*f*A
rcSin[c*x]^2)/(4*c^2*h) - (I*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]^2)/h^3
 - (b^2*(f*g - e*h)*x*ArcSin[c*x]^2)/h^2 + (b^2*f*x^2*ArcSin[c*x]^2)/(2*h)
- ((I/3)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]^3)/h^3 + (2*a*b*(f*g^2 - e
*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g
^2 - h^2])])/h^3 + (b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^
(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 + (2*a*b*(f*g^2 - e*g*
h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2
- h^2])])/h^3 + (b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*
ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + (a^2*(f*g^2 - e*g*h + d
*h^2)*Log[g + h*x])/h^3 - ((2*I)*a*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*
E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2
- e*g*h + d*h^2)*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt
[c^2*g^2 - h^2])])/h^3 - ((2*I)*a*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E
^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2 -
 e*g*h + d*h^2)*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[
c^2*g^2 - h^2])])/h^3 + (2*b^2*(f*g^2 - e*g*h + d*h^2)*PolyLog[3, (I*E^(I*A
rcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 + (2*b^2*(f*g^2 - e*g*h +
d*h^2)*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
```

```
&& IntegerQ[m]))
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 4843

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^2(d+ex+fx^2)}{g+hx} + \frac{2ab(d+ex+fx^2)\arcsin(cx)}{g+hx} + \frac{b^2(d+ex+fx^2)\arcsin(cx)^2}{g+hx}\right) dx$$

$$= a^2 \int \frac{d+ex+fx^2}{g+hx}\,dx + (2ab)\int \frac{(d+ex+fx^2)\arcsin(cx)}{g+hx}\,dx$$
$$+ b^2 \int \frac{(d+ex+fx^2)\arcsin(cx)^2}{g+hx}\,dx$$
$$= -\frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h}$$
$$+ \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log(g+hx)}{h^3}$$
$$+ a^2\int \left(\frac{-fg+eh}{h^2} + \frac{fx}{h} + \frac{fg^2-egh+dh^2}{h^2(g+hx)}\right)dx + b^2\int \left(\frac{(-fg+eh)\arcsin(cx)^2}{h^2}\right.$$
$$\left. + \frac{fx\arcsin(cx)^2}{h} + \frac{(fg^2-egh+dh^2)\arcsin(cx)^2}{h^2(g+hx)}\right)dx$$
$$- (2abc)\int \frac{hx(-2fg+2eh+fhx)+2(fg^2+h(-eg+dh))\log(g+hx)}{2h^3\sqrt{1-c^2x^2}}\,dx$$
$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h}$$
$$+ \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log(g+hx)}{h^3}$$
$$- \frac{(abc)\int \frac{hx(-2fg+2eh+fhx)+2(fg^2+h(-eg+dh))\log(g+hx)}{\sqrt{1-c^2x^2}}\,dx}{h^3} + \frac{(b^2f)\int x\arcsin(cx)^2\,dx}{h}$$
$$- \frac{(b^2(fg-eh))\int \arcsin(cx)^2\,dx}{h^2} + \frac{(b^2(fg^2-egh+dh^2))\int \frac{\arcsin(cx)^2}{g+hx}\,dx}{h^2}$$
$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2}$$
$$+ \frac{abfx^2\arcsin(cx)}{h} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h}$$
$$+ \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log(g+hx)}{h^3}$$
$$- \frac{(abc)\int \left(\frac{hx(-2fg+2eh+fhx)}{\sqrt{1-c^2x^2}} + \frac{2(fg^2-egh+dh^2)\log(g+hx)}{\sqrt{1-c^2x^2}}\right)dx}{h^3}$$
$$- \frac{(b^2cf)\int \frac{x^2\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{h} + \frac{(2b^2c(fg-eh))\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{h^2}$$
$$+ \frac{(b^2(fg^2-egh+dh^2))\operatorname{Subst}\left(\int \frac{x^2\cos(x)}{cg+h\sin(x)}\,dx, x, \arcsin(cx)\right)}{h^2}$$

$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log(g+hx)}{h^3} - \frac{(abc)\int\frac{x(-2fg+2eh+fhx)}{\sqrt{1-c^2x^2}}\,dx}{h^2} - \frac{(b^2f)\int x\,dx}{2h} - \frac{(b^2f)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2ch} + \frac{(2b^2(fg-eh))\int 1\,dx}{h^2} - \frac{(2abc(fg^2-egh+dh^2))\int\frac{\log(g+hx)}{\sqrt{1-c^2x^2}}\,dx}{h^3} + \frac{(b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{e^{ix}x^2}{cg-ie^{ix}h-\sqrt{c^2g^2-h^2}}\,dx,x,\arcsin(cx)\right)}{h^2} + \frac{(b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{e^{ix}x^2}{cg-ie^{ix}h+\sqrt{c^2g^2-h^2}}\,dx,x,\arcsin(cx)\right)}{h^2}$$

$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} - \frac{(abf)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2ch} - \frac{(2b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int x\log\left(1-\frac{ie^{ix}h}{cg-\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} - \frac{(2b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int x\log\left(1-\frac{ie^{ix}h}{cg+\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} + \frac{(2abc(fg^2-egh+dh^2))\int\frac{\arcsin(cx)}{cg+chx}\,dx}{h^2}$$

$$
\begin{aligned}
&= -\frac{a^2(fg-eh)x}{h^2}+\frac{2b^2(fg-eh)x}{h^2}+\frac{a^2fx^2}{2h}-\frac{b^2fx^2}{4h} \\
&\quad -\frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2}-\frac{abf\arcsin(cx)}{2c^2h}-\frac{2ab(fg-eh)x\arcsin(cx)}{h^2} \\
&\quad +\frac{abfx^2\arcsin(cx)}{h}-\frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&\quad +\frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch}-\frac{b^2f\arcsin(cx)^2}{4c^2h}-\frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} \\
&\quad +\frac{b^2fx^2\arcsin(cx)^2}{2h}-\frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} \\
&\quad +\frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad +\frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad +\frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} \\
&\quad -\frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad -\frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad +\frac{(2ib^2(fg^2-egh+dh^2))\,\mathrm{Subst}\left(\int \mathrm{PolyLog}\left(2,\frac{ie^{ix}h}{cg-\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} \\
&\quad +\frac{(2ib^2(fg^2-egh+dh^2))\,\mathrm{Subst}\left(\int \mathrm{PolyLog}\left(2,\frac{ie^{ix}h}{cg+\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} \\
&\quad +\frac{(2abc(fg^2-egh+dh^2))\,\mathrm{Subst}\left(\int \frac{x\cos(x)}{c^2g+ch\sin(x)}\,dx,x,\arcsin(cx)\right)}{h^2}
\end{aligned}
$$

$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} - \frac{abf\arcsin(cx)}{2c^2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{(2b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{ihx}{cg-\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{h^3} + \frac{(2b^2(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{ihx}{cg+\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{h^3} + \frac{(2abc(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2g-ice^{ix}h-c\sqrt{c^2g^2-h^2}}\,dx,x,\arcsin(cx)\right)}{h^2} + \frac{(2abc(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{e^{ix}x}{c^2g-ice^{ix}h+c\sqrt{c^2g^2-h^2}}\,dx,x,\arcsin(cx)\right)}{h^2}$$

$$
\begin{aligned}
&= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} \\
&\quad - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} - \frac{abf\arcsin(cx)}{2c^2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} \\
&\quad + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&\quad + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3} \\
&\quad - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} \\
&\quad + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} \\
&\quad - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad + \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad - \frac{(2ab(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\log\left(1-\frac{ice^{ix}h}{c^2g-c\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3} \\
&\quad - \frac{(2ab(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\log\left(1-\frac{ice^{ix}h}{c^2g+c\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3}
\end{aligned}
$$

$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} - \frac{abf\arcsin(cx)}{2c^2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{(2iab(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{ichx}{c^2g-c\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{h^3} + \frac{(2iab(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{ichx}{c^2g+c\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{h^3}$$

$$= -\frac{a^2(fg-eh)x}{h^2} + \frac{2b^2(fg-eh)x}{h^2} + \frac{a^2fx^2}{2h} - \frac{b^2fx^2}{4h} - \frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} - \frac{abf\arcsin(cx)}{2c^2h} - \frac{2ab(fg-eh)x\arcsin(cx)}{h^2} + \frac{abfx^2\arcsin(cx)}{h} - \frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} - \frac{b^2f\arcsin(cx)^2}{4c^2h} - \frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3} - \frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} + \frac{b^2fx^2\arcsin(cx)^2}{2h} - \frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3} - \frac{2iab(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2iab(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2b^2(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2b^2(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 556, normalized size of antiderivative = 0.52

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= \frac{12h(-fg+eh)x(a+b\arcsin(cx))^2+6fh^2x^2(a+b\arcsin(cx))^2-\frac{4i(fg^2+h(-eg+dh))(a+b\arcsin(cx))^3}{b}+24bh(fg\ldots}{}$$

```
[In] Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

```
[Out] (12*h*(-(f*g) + e*h)*x*(a + b*ArcSin[c*x])^2 + 6*f*h^2*x^2*(a + b*ArcSin[c*
x])^2 - ((4*I)*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^3)/b + 24*b*h
*(f*g - e*h)*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*b*f*h^2*
(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x]
)^2/(b*c^2)) + 12*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log[1 +
(I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 - h^2])] + 12*(f*g^2 + h*(-(
e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + S
qrt[c^2*g^2 - h^2])] - 24*b*(f*g^2 + h*(-(e*g) + d*h))*(I*(a + b*ArcSin[c*x
])*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] - b*Poly
Log[3, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]) - 24*b*(f*g^2
+ h*(-(e*g) + d*h))*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*
h)/(c*g + Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g
 + Sqrt[c^2*g^2 - h^2])]))/(12*h^3)
```

Maple [F]

$$\int \frac{(f\,x^2+ex+d)\,(a+b\arcsin{(cx)})^2}{hx+g}dx$$

```
[In] int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

```
[Out] int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

Fricas [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin{(cx)}+a)^2}{hx+g}\,dx$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="fricas")
```

```
[Out] integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcsi
n(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h*x + g), x)
```

Sympy [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(d+ex+fx^2)}{g+hx}\,dx$$

```
[In] integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g),x)
[Out] Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x), x)
```

Maxima [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="maxima")
[Out] a^2*e*(x/h - g*log(h*x + g)/h^2) + 1/2*a^2*f*(2*g^2*log(h*x + g)/h^3 + (h*x
^2 - 2*g*x)/h^2) + a^2*d*log(h*x + g)/h + integrate(((b^2*f*x^2 + b^2*e*x +
 b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*f*x^2 + a*b*e
*x + a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(h*x + g), x)
```

Giac [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="giac")
[Out] integrate((f*x^2 + e*x + d)*(b*arcsin(c*x) + a)^2/(h*x + g), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{g+h\,x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x),x)
[Out] int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x), x)
```

3.119 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 1323

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$$

$$= \frac{a^2fx}{h^2}-\frac{2b^2fx}{h^2}-\frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)}+\frac{2abf\sqrt{1-c^2x^2}}{ch^2}+\frac{2abfx\arcsin(cx)}{h^2}$$
$$-\frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)}+\frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}$$
$$+\frac{iab(2fg-eh)\arcsin(cx)^2}{h^3}+\frac{b^2fx\arcsin(cx)^2}{h^2}-\frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)}$$
$$+\frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3}+\frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$-\frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$-\frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+\frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$-\frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{a^2(2fg-eh)\log(g+hx)}{h^3}+\frac{2iab(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{2b^2c(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$+\frac{2ib^2(2fg-eh)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+\frac{2iab(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+\frac{2b^2c(fg^2-egh+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$+\frac{2ib^2(2fg-eh)\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$-\frac{2b^2(2fg-eh)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2b^2(2fg-eh)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

```
[Out] -a^2*(-e*h+2*f*g)*ln(h*x+g)/h^3-a^2*(d*h^2-e*g*h+f*g^2)/h^3/(h*x+g)+a^2*f*x
/h^2-2*I*b^2*c*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)-b^2*(-e*h+2*f*g)
*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)
))/h^3-b^2*(-e*h+2*f*g)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(
c*g+(c^2*g^2-h^2)^(1/2)))/h^3+I*a*b*(-e*h+2*f*g)*arcsin(c*x)^2/h^3+b^2*f*x*
arcsin(c*x)^2/h^2-b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2/h^3/(h*x+g)+2*a*b*c
*(d*h^2-e*g*h+f*g^2)*arctan((c^2*g*x+h)/(c^2*g^2-h^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/h^3/(c^2*g^2-h^2)^(1/2)+2*a*b*f*x*arcsin(c*x)/h^2-2*a*b*(d*h^2-e*g*h+f
*g^2)*arcsin(c*x)/h^3/(h*x+g)+2*b^2*f*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/h^2-
2*a*b*(-e*h+2*f*g)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^
2*g^2-h^2)^(1/2)))/h^3-2*a*b*(-e*h+2*f*g)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x
^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*b^2*c*(d*h^2-e*g*h+f*g^2)*p
olylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3/(c^2
*g^2-h^2)^(1/2)+2*b^2*c*(d*h^2-e*g*h+f*g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)+2*a*b*f*(-c^2*
x^2+1)^(1/2)/c/h^2-2*b^2*(-e*h+2*f*g)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)
)*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*b^2*(-e*h+2*f*g)*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*b^2*f*x/h^2+2*I*a*b*(-
e*h+2*f*g)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2
)))/h^3+2*I*b^2*(-e*h+2*f*g)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1
/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*I*a*b*(-e*h+2*f*g)*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+2*I*b^2*(-e*h+2*f*g
)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(
1/2)))/h^3+2*I*b^2*c*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^
2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)+1/3*I*b^2*
(-e*h+2*f*g)*arcsin(c*x)^3/h^3
```

Rubi [A] (verified)

Time = 1.68 (sec) , antiderivative size = 1323, normalized size of antiderivative = 1.00, number of steps used = 45, number of rules used = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.893$, Rules used = {4843, 712, 4837, 12, 6874, 267, 739, 210, 222, 2451, 4825, 4615, 2221, 2317, 2438,

4715, 4767, 8, 4827, 4857, 3404, 2296, 2611, 2320, 6724}

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$$

$$= \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3} - \frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3} - \frac{b^2(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3(g+hx)} + \frac{2abfx\arcsin(cx)}{h^2} - \frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3} - \frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}} - \frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3} + \frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}} + \frac{2ib^2(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3} + \frac{2ib^2(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} - \frac{2ab(fg^2-ehg+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{a^2fx}{h^2} - \frac{2b^2fx}{h^2} + \frac{2abc(fg^2-ehg+dh^2)\arctan\left(\frac{gxc^2+h}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3} + \frac{2iab(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2b^2c(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} + \frac{2iab(2fg-eh)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2b^2c(fg^2-ehg+dh^2)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{2b^2(2fg-eh)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{2b^2(2fg-eh)\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} - \frac{a^2(fg^2-ehg+dh^2)}{h^3(g+hx)}$$

```
[In] Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

```
[Out] (a^2*f*x)/h^2 - (2*b^2*f*x)/h^2 - (a^2*(f*g^2 - e*g*h + d*h^2))/(h^3*(g + h
*x)) + (2*a*b*f*Sqrt[1 - c^2*x^2])/(c*h^2) + (2*a*b*f*x*ArcSin[c*x])/h^2 -
(2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x])/(h^3*(g + h*x)) + (2*b^2*f*Sqrt
[1 - c^2*x^2]*ArcSin[c*x])/(c*h^2) + (I*a*b*(2*f*g - e*h)*ArcSin[c*x]^2)/h^
3 + (b^2*f*x*ArcSin[c*x]^2)/h^2 - (b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]^
2)/(h^3*(g + h*x)) + ((I/3)*b^2*(2*f*g - e*h)*ArcSin[c*x]^3)/h^3 + (2*a*b*c
*(f*g^2 - e*g*h + d*h^2)*ArcTan[(h + c^2*g*x)/(Sqrt[c^2*g^2 - h^2]*Sqrt[1 -
 c^2*x^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (2*a*b*(2*f*g - e*h)*ArcSin[c*x]*L
og[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - ((2*I)*b
^2*c*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c
*g - Sqrt[c^2*g^2 - h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (b^2*(2*f*g - e*h)*
ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])
/h^3 - (2*a*b*(2*f*g - e*h)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*
g + Sqrt[c^2*g^2 - h^2])])/h^3 + ((2*I)*b^2*c*(f*g^2 - e*g*h + d*h^2)*ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/(h^3*S
qrt[c^2*g^2 - h^2]) - (b^2*(2*f*g - e*h)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcS
in[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 - (a^2*(2*f*g - e*h)*Log[g +
h*x])/h^3 + ((2*I)*a*b*(2*f*g - e*h)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*
g - Sqrt[c^2*g^2 - h^2])])/h^3 - (2*b^2*c*(f*g^2 - e*g*h + d*h^2)*PolyLog[2
, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/(h^3*Sqrt[c^2*g^2 -
 h^2]) + ((2*I)*b^2*(2*f*g - e*h)*ArcSin[c*x]*PolyLog[2, (I*E^(I*ArcSin[c*x
])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 + ((2*I)*a*b*(2*f*g - e*h)*PolyLog[
2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + (2*b^2*c*(f*
g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2
 - h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) + ((2*I)*b^2*(2*f*g - e*h)*ArcSin[c*x]
*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 - (2*
b^2*(2*f*g - e*h)*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 -
h^2])])/h^3 - (2*b^2*(2*f*g - e*h)*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g
+ Sqrt[c^2*g^2 - h^2])])/h^3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2451

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Dist[b*e*n, Int[SimplifyIntegrand[u/(d + e*x),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4615

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4837

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Dist[a + b*ArcSin[c*x], u
, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /;
FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Rule 4843

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
```

```
Q[m, 0] || IGtQ[n, 0])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a^2(d+ex+fx^2)}{(g+hx)^2} + \frac{2ab(d+ex+fx^2)\arcsin(cx)}{(g+hx)^2} + \frac{b^2(d+ex+fx^2)\arcsin(cx)^2}{(g+hx)^2}\right) dx$$

$$= a^2 \int \frac{d+ex+fx^2}{(g+hx)^2} dx + (2ab) \int \frac{(d+ex+fx^2)\arcsin(cx)}{(g+hx)^2} dx + b^2 \int \frac{(d+ex+fx^2)\arcsin(cx)^2}{(g+hx)^2} dx$$

$$= \frac{2abfx\arcsin(cx)}{h^2} - \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} - \frac{2ab(2fg-eh)\arcsin(cx)\log(g+hx)}{h^3} + a^2 \int \left(\frac{f}{h^2} + \frac{fg^2-egh+dh^2}{h^2(g+hx)^2} + \frac{-2fg+eh}{h^2(g+hx)}\right) dx + b^2 \int \left(\frac{f\arcsin(cx)^2}{h^2} + \frac{(fg^2-egh+dh^2)\arcsin(cx)^2}{h^2(g+hx)^2} + \frac{(-2fg+eh)\arcsin(cx)^2}{h^2(g+hx)}\right) dx - (2abc) \int \frac{fhx - \frac{fg^2-egh+dh^2}{g+hx} - (2fg-eh)\log(g+hx)}{h^3\sqrt{1-c^2x^2}} dx$$

$$= \frac{a^2fx}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abfx\arcsin(cx)}{h^2} - \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3} - \frac{2ab(2fg-eh)\arcsin(cx)\log(g+hx)}{h^3} - \frac{(2abc)\int \frac{fhx - \frac{fg^2-egh+dh^2}{g+hx} - (2fg-eh)\log(g+hx)}{\sqrt{1-c^2x^2}} dx}{h^3} + \frac{(b^2f)\int \arcsin(cx)^2 dx}{h^2} - \frac{(b^2(2fg-eh))\int \frac{\arcsin(cx)^2}{g+hx} dx}{h^2} + \frac{(b^2(fg^2-egh+dh^2))\int \frac{\arcsin(cx)^2}{(g+hx)^2} dx}{h^2}$$

$$
\begin{aligned}
&= \frac{a^2 f x}{h^2} - \frac{a^2(fg^2 - egh + dh^2)}{h^3(g+hx)} + \frac{2abfx\arcsin(cx)}{h^2} - \frac{2ab(fg^2 - egh + dh^2)\arcsin(cx)}{h^3(g+hx)} \\
&\quad + \frac{b^2 f x \arcsin(cx)^2}{h^2} - \frac{b^2(fg^2 - egh + dh^2)\arcsin(cx)^2}{h^3(g+hx)} \\
&\quad - \frac{a^2(2fg - eh)\log(g+hx)}{h^3} - \frac{2ab(2fg - eh)\arcsin(cx)\log(g+hx)}{h^3} \\
&\quad - \frac{(2abc)\int \left(\frac{fhx}{\sqrt{1-c^2x^2}} + \frac{-fg^2+egh-dh^2}{(g+hx)\sqrt{1-c^2x^2}} - \frac{(2fg-eh)\log(g+hx)}{\sqrt{1-c^2x^2}}\right) dx}{h^3} \\
&\quad - \frac{(2b^2cf)\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\, dx}{h^2} - \frac{(b^2(2fg - eh))\operatorname{Subst}\left(\int \frac{x^2\cos(x)}{cg+h\sin(x)}\, dx, x, \arcsin(cx)\right)}{h^2} \\
&\quad + \frac{(2b^2c(fg^2 - egh + dh^2))\int \frac{\arcsin(cx)}{(g+hx)\sqrt{1-c^2x^2}}\, dx}{h^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2 f x}{h^2} - \frac{a^2(fg^2 - egh + dh^2)}{h^3(g+hx)} + \frac{2abfx\arcsin(cx)}{h^2} \\
&\quad - \frac{2ab(fg^2 - egh + dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2 f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&\quad + \frac{b^2 f x \arcsin(cx)^2}{h^2} - \frac{b^2(fg^2 - egh + dh^2)\arcsin(cx)^2}{h^3(g+hx)} + \frac{ib^2(2fg - eh)\arcsin(cx)^3}{3h^3} \\
&\quad - \frac{a^2(2fg - eh)\log(g+hx)}{h^3} - \frac{2ab(2fg - eh)\arcsin(cx)\log(g+hx)}{h^3} \\
&\quad - \frac{(2b^2 f)\int 1\, dx}{h^2} - \frac{(2abcf)\int \frac{x}{\sqrt{1-c^2x^2}}\, dx}{h^2} + \frac{(2abc(2fg - eh))\int \frac{\log(g+hx)}{\sqrt{1-c^2x^2}}\, dx}{h^3} \\
&\quad - \frac{(b^2(2fg - eh))\operatorname{Subst}\left(\int \frac{e^{ix}x^2}{cg - ie^{ix}h - \sqrt{c^2g^2-h^2}}\, dx, x, \arcsin(cx)\right)}{h^2} \\
&\quad - \frac{(b^2(2fg - eh))\operatorname{Subst}\left(\int \frac{e^{ix}x^2}{cg - ie^{ix}h + \sqrt{c^2g^2-h^2}}\, dx, x, \arcsin(cx)\right)}{h^2} \\
&\quad + \frac{(2abc(fg^2 - egh + dh^2))\int \frac{1}{(g+hx)\sqrt{1-c^2x^2}}\, dx}{h^3} \\
&\quad + \frac{(2b^2c(fg^2 - egh + dh^2))\operatorname{Subst}\left(\int \frac{x}{cg+h\sin(x)}\, dx, x, \arcsin(cx)\right)}{h^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2 f x}{h^2} - \frac{2b^2 f x}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2} \\
&\quad - \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2 f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&\quad + \frac{b^2 f x\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)} \\
&\quad + \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} - \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&\quad - \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3} \\
&\quad + \frac{(2b^2(2fg-eh))\operatorname{Subst}\left(\int x\log\left(1-\frac{ie^{ix}h}{cg-\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} \\
&\quad + \frac{(2b^2(2fg-eh))\operatorname{Subst}\left(\int x\log\left(1-\frac{ie^{ix}h}{cg+\sqrt{c^2g^2-h^2}}\right)\,dx,x,\arcsin(cx)\right)}{h^3} \\
&\quad - \frac{(2abc(2fg-eh))\int\frac{\arcsin(cx)}{cg+chx}\,dx}{h^2} \\
&\quad - \frac{(2abc(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\frac{1}{-c^2g^2+h^2-x^2}\,dx,x,\frac{h+c^2gx}{\sqrt{1-c^2x^2}}\right)}{h^3} \\
&\quad + \frac{(4b^2c(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\frac{e^{ix}x}{2ce^{ix}g+ih-ie^{2ix}h}\,dx,x,\arcsin(cx)\right)}{h^3}
\end{aligned}
$$

$$= \frac{a^2 fx}{h^2} - \frac{2b^2 fx}{h^2} - \frac{a^2(fg^2 - egh + dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2}$$
$$- \frac{2ab(fg^2 - egh + dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2 f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}$$
$$+ \frac{b^2 fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2 - egh + dh^2)\arcsin(cx)^2}{h^3(g+hx)}$$
$$+ \frac{ib^2(2fg - eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2 - egh + dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$- \frac{b^2(2fg - eh)\arcsin(cx)^2\log\left(1 - \frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{b^2(2fg - eh)\arcsin(cx)^2\log\left(1 - \frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{a^2(2fg - eh)\log(g+hx)}{h^3}$$
$$+ \frac{2ib^2(2fg - eh)\arcsin(cx)\,\text{PolyLog}\left(2, \frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2ib^2(2fg - eh)\arcsin(cx)\,\text{PolyLog}\left(2, \frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{(2ib^2(2fg - eh))\,\text{Subst}\left(\int \text{PolyLog}\left(2, \frac{ie^{ix}h}{cg-\sqrt{c^2g^2-h^2}}\right)\,dx, x, \arcsin(cx)\right)}{h^3}$$
$$- \frac{(2ib^2(2fg - eh))\,\text{Subst}\left(\int \text{PolyLog}\left(2, \frac{ie^{ix}h}{cg+\sqrt{c^2g^2-h^2}}\right)\,dx, x, \arcsin(cx)\right)}{h^3}$$
$$- \frac{(2abc(2fg - eh))\text{Subst}\left(\int \frac{x\cos(x)}{c^2g+ch\sin(x)}\,dx, x, \arcsin(cx)\right)}{h^2}$$
$$- \frac{(4ib^2c(fg^2 - egh + dh^2))\,\text{Subst}\left(\int \frac{e^{ix}x}{2cg-2ie^{ix}h-2\sqrt{c^2g^2-h^2}}\,dx, x, \arcsin(cx)\right)}{h^2\sqrt{c^2g^2-h^2}}$$
$$+ \frac{(4ib^2c(fg^2 - egh + dh^2))\,\text{Subst}\left(\int \frac{e^{ix}x}{2cg-2ie^{ix}h+2\sqrt{c^2g^2-h^2}}\,dx, x, \arcsin(cx)\right)}{h^2\sqrt{c^2g^2-h^2}}$$

$$= \frac{a^2fx}{h^2} - \frac{2b^2fx}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2} - \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} + \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)} + \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3} + \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} + \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{(2b^2(2fg-eh))\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{ihx}{cg-\sqrt{c^2g^2-h^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{h^3} - \frac{(2b^2(2fg-eh))\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{ihx}{cg+\sqrt{c^2g^2-h^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{h^3} - \frac{(2abc(2fg-eh))\operatorname{Subst}\left(\int\frac{e^{ix}x}{c^2g-ice^{ix}h-c\sqrt{c^2g^2-h^2}}dx,x,\arcsin(cx)\right)}{h^2} - \frac{(2abc(2fg-eh))\operatorname{Subst}\left(\int\frac{e^{ix}x}{c^2g-ice^{ix}h+c\sqrt{c^2g^2-h^2}}dx,x,\arcsin(cx)\right)}{h^2} + \frac{(2ib^2c(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\log\left(1-\frac{2ie^{ix}h}{2cg-2\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3\sqrt{c^2g^2-h^2}} - \frac{(2ib^2c(fg^2-egh+dh^2))\operatorname{Subst}\left(\int\log\left(1-\frac{2ie^{ix}h}{2cg+2\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$= \frac{a^2fx}{h^2} - \frac{2b^2fx}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2}$$
$$- \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}$$
$$+ \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)}$$
$$+ \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3}$$
$$+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$
$$+ \frac{(2ab(2fg-eh))\text{Subst}\left(\int\log\left(1-\frac{ice^{ix}h}{c^2g-c\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3}$$
$$+ \frac{(2ab(2fg-eh))\text{Subst}\left(\int\log\left(1-\frac{ice^{ix}h}{c^2g+c\sqrt{c^2g^2-h^2}}\right)dx,x,\arcsin(cx)\right)}{h^3}$$
$$+ \frac{(2b^2c(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2ihx}{2cg-2\sqrt{c^2g^2-h^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{h^3\sqrt{c^2g^2-h^2}}$$
$$- \frac{(2b^2c(fg^2-egh+dh^2))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2ihx}{2cg+2\sqrt{c^2g^2-h^2}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$
\begin{aligned}
&= \frac{a^2 f x}{h^2} - \frac{2b^2 f x}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2} \\
&- \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&+ \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)} \\
&+ \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+ \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} - \frac{a^2(2fg-eh)\log(g+hx)}{h^3} \\
&- \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+ \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{(2iab(2fg-eh))\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{ichx}{c^2g-c\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{h^3} \\
&- \frac{(2iab(2fg-eh))\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{ichx}{c^2g+c\sqrt{c^2g^2-h^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{a^2fx}{h^2} - \frac{2b^2fx}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2} \\
&- \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2} \\
&+ \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)} \\
&+ \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+ \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{a^2(2fg-eh)\log(g+hx)}{h^3} + \frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+ \frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+ \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}} \\
&+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 688, normalized size of antiderivative = 0.52

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$$

$$= \frac{3fhx(a+b\arcsin(cx))^2 - \frac{3(fg^2+h(-eg+dh))(a+b\arcsin(cx))^2}{g+hx} + \frac{i(2fg-eh)(a+b\arcsin(cx))^3}{b} - 6bfh\left(bx - \frac{\sqrt{1-c^2x^2}(a+b\arc}{c}\right.}{}$$

```
[In] Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

```
[Out] (3*f*h*x*(a + b*ArcSin[c*x])^2 - (3*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSi
n[c*x])^2)/(g + h*x) + (I*(2*f*g - e*h)*(a + b*ArcSin[c*x])^3)/b - 6*b*f*h*
(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*(2*f*g - e*h)*(a + b*
ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 - h^2
])] - 3*(2*f*g - e*h)*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)
/(c*g + Sqrt[c^2*g^2 - h^2])] + (6*b*c*(f*g^2 + h*(-(e*g) + d*h))*((-I)*(a
+ b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 -
h^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]) - b*
PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] + b*PolyLog
[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/Sqrt[c^2*g^2 - h
^2] + 6*b*(2*f*g - e*h)*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*
x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/
(c*g - Sqrt[c^2*g^2 - h^2])]) + 6*b*(2*f*g - e*h)*(I*(a + b*ArcSin[c*x])*Po
lyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3
, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/(3*h^3)
```

Maple [F]

$$\int \frac{(f\,x^2+ex+d)\,(a+b\arcsin(cx))^2}{(hx+g)^2}dx$$

```
[In] int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

```
[Out] int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

Fricas [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{(hx+g)^2}\,dx$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="fricas"
)
```

```
[Out] integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcsi
n(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h^2*x^2 + 2*g*h*x
+ g^2), x)
```

Sympy [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))^2(d+ex+fx^2)}{(g+hx)^2}\,dx$$

```
[In] integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(h-c*g>0)', see `assume?` for more d
etails)
```

Giac [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{(hx+g)^2}\,dx$$

```
[In] integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="giac")
[Out] integrate((f*x^2 + e*x + d)*(b*arcsin(c*x) + a)^2/(h*x + g)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{(g+h\,x)^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2,x)
[Out] int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2, x)
```

3.120 $\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 520

$$\begin{aligned}\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx &= -\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e}\\ &\quad-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\ &\quad-\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\ &\quad+\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\ &\quad-\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\end{aligned}$$

```
[Out] -2*b^2*h*x/e+h*x*(a+b*arcsin(c*x))^2/e-(f-d^2*h/e^2)*(a+b*arcsin(c*x))^2/(e
*x+d)+2*a*b*c*(-d^2*h+e^2*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x
^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x)*l
n(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-
e^2)^(1/2)+2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1
)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)-2*b^2*c*(-d^2*h
+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))
/e^2/(c^2*d^2-e^2)^(1/2)+2*b^2*c*(-d^2*h+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*a*b*h*(-
c^2*x^2+1)^(1/2)/c/e+2*b^2*h*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 520, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.545$, Rules used = {697, 4841, 6874, 267, 739, 210, 4883, 1668, 12, 4881, 4767, 8, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$
$$= -\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$
$$+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{2abh\sqrt{1-c^2x^2}}{ce}$$
$$-\frac{2b^2c(e^2f-d^2h)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{2b^2c(e^2f-d^2h)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$-\frac{2ib^2c\arcsin(cx)(e^2f-d^2h)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+\frac{2ib^2c\arcsin(cx)(e^2f-d^2h)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e^2\sqrt{c^2d^2-e^2}}$$
$$+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}-\frac{2b^2hx}{e}$$

```
[In] Int[((e*f + 2*d*h*x + e*h*x^2)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

```
[Out] (-2*b^2*h*x)/e + (2*a*b*h*Sqrt[1 - c^2*x^2])/(c*e) + (2*b^2*h*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(c*e) + (h*x*(a + b*ArcSin[c*x])^2)/e - ((f - (d^2*h)/e^2
)*(a + b*ArcSin[c*x])^2)/(d + e*x) + (2*a*b*c*(e^2*f - d^2*h)*ArcTan[(e + c
^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^2*Sqrt[c^2*d^2 - e^2])
 - ((2*I)*b^2*c*(e^2*f - d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))
/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + ((2*I)*b^2*c*(e^
2*f - d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^
2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (2*b^2*c*(e^2*f - d^2*h)*PolyLog[2,
 (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 -
e^2]) + (2*b^2*c*(e^2*f - d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} \\
&\quad -(2bc)\int \frac{\left(\frac{hx}{e}-\frac{f-\frac{d^2h}{e^2}}{d+ex}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} \\
&\quad -(2bc)\int \left(\frac{a(-e^2f+d^2h+dehx+e^2hx^2)}{e^2(d+ex)\sqrt{1-c^2x^2}} \right. \\
&\qquad \left. +\frac{b(-e^2f+d^2h+dehx+e^2hx^2)\arcsin(cx)}{e^2(d+ex)\sqrt{1-c^2x^2}}\right)dx
\end{aligned}
$$

$$= \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} - \frac{(2abc)\int \frac{-e^2f+d^2h+dehx+e^2hx^2}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2} - \frac{(2b^2c)\int \frac{(-e^2f+d^2h+dehx+e^2hx^2)\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2}$$

$$= \frac{2abh\sqrt{1-c^2x^2}}{ce} + \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} + \frac{(2ab)\int \frac{c^2e^2(e^2f-d^2h)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{ce^4} - \frac{(2b^2c)\int \left(\frac{ehx\arcsin(cx)}{\sqrt{1-c^2x^2}} + \frac{(-e^2f+d^2h)\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\right)dx}{e^2}$$

$$= \frac{2abh\sqrt{1-c^2x^2}}{ce} + \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} - \frac{(2b^2ch)\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{e} + \frac{(2abc(e^2f-d^2h))\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2} - \frac{(2b^2c(-e^2f+d^2h))\int \frac{\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^2}$$

$$= \frac{2abh\sqrt{1-c^2x^2}}{ce} + \frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} - \frac{(2b^2h)\int 1\,dx}{e} - \frac{(2abc(e^2f-d^2h))\,\text{Subst}\left(\int \frac{1}{-c^2d^2+e^2-x^2}\,dx, x, \frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^2} - \frac{(2b^2c(-e^2f+d^2h))\,\text{Subst}\left(\int \frac{x}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^2}$$

$$= -\frac{2b^2hx}{e} + \frac{2abh\sqrt{1-c^2x^2}}{ce} + \frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} + \frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{(4b^2c(-e^2f+d^2h))\,\text{Subst}\left(\int \frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}\,dx, x, \arcsin(cx)\right)}{e^2}$$

$$=-\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e} -\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} -\frac{(4ib^2c(e^2f-d^2h))\,\text{Subst}\left(\int\frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}} +\frac{(4ib^2c(e^2f-d^2h))\,\text{Subst}\left(\int\frac{e^{ix}x}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{e\sqrt{c^2d^2-e^2}}$$

$$=-\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e} -\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} -\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} +\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} +\frac{(2ib^2c(e^2f-d^2h))\,\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}} -\frac{(2ib^2c(e^2f-d^2h))\,\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}}$$

$$=-\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e} -\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} -\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} +\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} +\frac{(2b^2c(e^2f-d^2h))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^2\sqrt{c^2d^2-e^2}} -\frac{(2b^2c(e^2f-d^2h))\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^2\sqrt{c^2d^2-e^2}}$$

$$= -\frac{2b^2hx}{e} + \frac{2abh\sqrt{1-c^2x^2}}{ce} + \frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} + \frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.59

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} - \frac{2bh\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e} + \frac{2bc(e^2f-d^2h)\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\operatorname{PolyLog}\left(2,\right.\right.}{e^2\sqrt{c^2d^2-e^2}}$$

```
[In] Integrate[((e*f + 2*d*h*x + e*h*x^2)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

```
[Out] (h*x*(a + b*ArcSin[c*x])^2)/e - ((f - (d^2*h)/e^2)*(a + b*ArcSin[c*x])^2)/(
d + e*x) - (2*b*h*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c))/e + (2
*b*c*(e^2*f - d^2*h)*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*
x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d
 + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqr
t[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d
^2 - e^2])]))/(e^2*Sqrt[c^2*d^2 - e^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1250 vs. 2(520) = 1040.

Time = 3.86 (sec) , antiderivative size = 1251, normalized size of antiderivative = 2.41

method	result	size
parts	Expression too large to display	1251
derivativedivides	Expression too large to display	1277
default	Expression too large to display	1277

```
[In] int((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURNVER
BOSE)
```

```
[Out] a^2*(h/e*x-(-d^2*h+e^2*f)/e^2/(e*x+d))+2*b^2*h*arcsin(c*x)*(-c^2*x^2+1)^(1/
2)/c/e+b^2*h/e*arcsin(c*x)^2*x-2*b^2*h*x/e+b^2*c*arcsin(c*x)^2/e^2/(c*e*x+c
*d)*d^2*h-b^2*c*arcsin(c*x)^2/(c*e*x+c*d)*f+2*b^2*c*(-c^2*d^2+e^2)^(1/2)/e^
2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^
2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2*h-2*b^2*c*(-c^2*d^2+e^2)^(1
/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f-2*b^2*c*(-c^2*d^2+e^2)^(1/2
)/e^2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^
2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*h+2*b^2*c*(-c^2*d^2+e^2
)^(1/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-
c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f-2*I*b^2*c*(-c^2*d^2+e^2
)^(1/2)/e^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d
^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*h*d^2+2*I*b^2*c*(-c^2*d^2+e^2)
^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^
2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f+2*I*b^2*c*(-c^2*d^2+e^2)^(1/2)/e^
2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1
/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*h*d^2-2*I*b^2*c*(-c^2*d^2+e^2)^(1/2)/(c^
2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/
(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f+2*a*b/c*(arcsin(c*x)*h/e*c*x+arcsin(c*x)*c^
2/e^2/(c*e*x+c*d)*d^2*h-arcsin(c*x)*c^2/(c*e*x+c*d)*f-1/e^2*(-e*h*(-c^2*x^2
+1)^(1/2)-c^2*(d^2*h-e^2*f)/e/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^
2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d
*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))))
```

Fricas [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\int \frac{(ehx^2+2\,dhx+ef)(b\arcsin{(cx)}+a)^2}{(ex+d)^2}\,dx$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm=
"fricas")
```

```
[Out] integral((a^2*e*h*x^2 + 2*a^2*d*h*x + a^2*e*f + (b^2*e*h*x^2 + 2*b^2*d*h*x
+ b^2*e*f)*arcsin(c*x)^2 + 2*(a*b*e*h*x^2 + 2*a*b*d*h*x + a*b*e*f)*arcsin(c
*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})^2\cdot(2dhx+ef+ehx^2)}{(d+ex)^2}\,dx$$

```
[In] integrate((e*h*x**2+2*d*h*x+e*f)*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm=
"maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{(ehx^2+2\,dhx+ef)(b\arcsin{(cx)}+a)^2}{(ex+d)^2}\,dx$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm=
"giac")
```

```
[Out] integrate((e*h*x^2 + 2*d*h*x + e*f)*(b*arcsin(c*x) + a)^2/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e\,h\,x^2+2\,d\,h\,x+e\,f)}{(d+e\,x)^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2, x)
```

3.121 $\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 920

$$
\begin{aligned}
&\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx \\
&= -\frac{4b^2h^2x}{9c^2}-\frac{2b^2h(2e^2f-d^2h)\,x}{e^2}-\frac{b^2dh^2x^2}{2e}-\frac{2}{27}b^2h^2x^3 \\
&+\frac{abh(4e^2h+c^2(36e^2f-25d^2h))\sqrt{1-c^2x^2}}{9c^3e^2}+\frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} \\
&+\frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2}-\frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} \\
&+\frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3}+\frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} \\
&+\frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} \\
&-\frac{b^2d^3h^2\arcsin(cx)^2}{3e^3}-\frac{b^2dh^2\arcsin(cx)^2}{2c^2e}+\frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} \\
&-\frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} \\
&+\frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&-\frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+\frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&-\frac{2b^2c(e^2f-d^2h)^2\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+\frac{2b^2c(e^2f-d^2h)^2\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}
\end{aligned}
$$

```
[Out] -4/9*b^2*h^2*x/c^2-2*b^2*h*(-d^2*h+2*e^2*f)*x/e^2-1/2*b^2*d*h^2*x^2/e-2/27*
b^2*h^2*x^3-1/3*a*b*d*(2*c^2*d^2+3*e^2)*h^2*arcsin(c*x)/c^2/e^3-1/3*b^2*d^3
*h^2*arcsin(c*x)^2/e^3-1/2*b^2*d*h^2*arcsin(c*x)^2/c^2/e+2*h*(-d^2*h+e^2*f)
*x*(a+b*arcsin(c*x))^2/e^2-(-d^2*h+e^2*f)^2*(a+b*arcsin(c*x))^2/e^3/(e*x+d)
+1/3*h^2*(e*x+d)^3*(a+b*arcsin(c*x))^2/e^3+2*a*b*c*(-d^2*h+e^2*f)^2*arctan(
(c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(1/2)
+2*I*b^2*c*(-d^2*h+e^2*f)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))
/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2*h+e^2*f
)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2
```

```
)))/e^3/(c^2*d^2-e^2)^(1/2)-2*b^2*c*(-d^2*h+e^2*f)^2*polylog(2,I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)+2*b^2
*c*(-d^2*h+e^2*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-
e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)+1/9*a*b*h*(4*e^2*h+c^2*(-25*d^2*h+36*e
^2*f))*(-c^2*x^2+1)^(1/2)/c^3/e^2+5/9*a*b*d*h^2*(e*x+d)*(-c^2*x^2+1)^(1/2)/
c/e^2+2/9*a*b*h^2*(e*x+d)^2*(-c^2*x^2+1)^(1/2)/c/e^2+4/9*b^2*h^2*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)/c^3+2*b^2*h*(-d^2*h+2*e^2*f)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)/c/e^2+b^2*d*h^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/e+2/9*b^2*h^2*x^2*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 2.72 (sec) , antiderivative size = 920, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.714$, Rules used = {697, 4841, 12, 6874, 267, 739, 210, 757, 794, 222, 4883, 1668, 858, 4881, 4737, 4767, 8, 4795, 30, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b\arcsin(cx))^2}{(d + ex)^2} dx$$

$$= -\frac{b^2h^2 \arcsin(cx)^2 d^3}{3e^3} - \frac{b^2h^2x^2d}{2e} - \frac{b^2h^2 \arcsin(cx)^2 d}{2c^2e} - \frac{ab(2c^2d^2 + 3e^2)\, h^2 \arcsin(cx) d}{3c^2e^3} + \frac{b^2h^2x\sqrt{1 - c^2x^2} \arcsin(cx) d}{ce} + \frac{5abh^2(d + ex)\sqrt{1 - c^2x^2} d}{9ce^2} - \frac{2}{27} b^2h^2x^3 + \frac{h^2(d + ex)^3(a + b\arcsin(cx))^2}{3e^3} + \frac{2h(e^2f - d^2h)\, x(a + b\arcsin(cx))^2}{e^2} - \frac{(e^2f - d^2h)^2 (a + b\arcsin(cx))^2}{e^3(d + ex)} - \frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f - d^2h)\, x}{e^2} + \frac{4b^2h^2\sqrt{1 - c^2x^2} \arcsin(cx)}{9c^3} + \frac{2b^2h^2x^2\sqrt{1 - c^2x^2} \arcsin(cx)}{9c} + \frac{2b^2h(2e^2f - d^2h)\sqrt{1 - c^2x^2} \arcsin(cx)}{ce^2} + \frac{2abc(e^2f - d^2h)^2 \arctan\left(\frac{dxc^2 + e}{\sqrt{c^2d^2 - e^2}\sqrt{1 - c^2x^2}}\right)}{e^3\sqrt{c^2d^2 - e^2}} - \frac{2ib^2c(e^2f - d^2h)^2 \arcsin(cx) \log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd - \sqrt{c^2d^2 - e^2}}\right)}{e^3\sqrt{c^2d^2 - e^2}} + \frac{2ib^2c(e^2f - d^2h)^2 \arcsin(cx) \log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd + \sqrt{c^2d^2 - e^2}}\right)}{e^3\sqrt{c^2d^2 - e^2}} - \frac{2b^2c(e^2f - d^2h)^2 \operatorname{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd - \sqrt{c^2d^2 - e^2}}\right)}{e^3\sqrt{c^2d^2 - e^2}} + \frac{2b^2c(e^2f - d^2h)^2 \operatorname{PolyLog}\left(2, \frac{iee^{i\arcsin(cx)}}{cd + \sqrt{c^2d^2 - e^2}}\right)}{e^3\sqrt{c^2d^2 - e^2}} + \frac{2abh^2(d + ex)^2\sqrt{1 - c^2x^2}}{9ce^2} + \frac{abh((36e^2f - 25d^2h)\, c^2 + 4e^2h)\sqrt{1 - c^2x^2}}{9c^3e^2}$$

```
[In] Int[((e*f + 2*d*h*x + e*h*x^2)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

```
[Out] (-4*b^2*h^2*x)/(9*c^2) - (2*b^2*h*(2*e^2*f - d^2*h)*x)/e^2 - (b^2*d*h^2*x^2
)/(2*e) - (2*b^2*h^2*x^3)/27 + (a*b*h*(4*e^2*h + c^2*(36*e^2*f - 25*d^2*h))
*Sqrt[1 - c^2*x^2])/(9*c^3*e^2) + (5*a*b*d*h^2*(d + e*x)*Sqrt[1 - c^2*x^2])
/(9*c*e^2) + (2*a*b*h^2*(d + e*x)^2*Sqrt[1 - c^2*x^2])/(9*c*e^2) - (a*b*d*(
2*c^2*d^2 + 3*e^2)*h^2*ArcSin[c*x])/(3*c^2*e^3) + (4*b^2*h^2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x])/(9*c^3) + (2*b^2*h*(2*e^2*f - d^2*h)*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x])/(c*e^2) + (b^2*d*h^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*e) + (2*
b^2*h^2*x^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(9*c) - (b^2*d^3*h^2*ArcSin[c*x]
^2)/(3*e^3) - (b^2*d*h^2*ArcSin[c*x]^2)/(2*c^2*e) + (2*h*(e^2*f - d^2*h)*x*
(a + b*ArcSin[c*x])^2)/e^2 - ((e^2*f - d^2*h)^2*(a + b*ArcSin[c*x])^2)/(e^3
*(d + e*x)) + (h^2*(d + e*x)^3*(a + b*ArcSin[c*x])^2)/(3*e^3) + (2*a*b*c*(e
^2*f - d^2*h)^2*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]
```

```
)])/(e^3*Sqrt[c^2*d^2 - e^2]) - ((2*I)*b^2*c*(e^2*f - d^2*h)^2*ArcSin[c*x]*
Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2
*d^2 - e^2]) + ((2*I)*b^2*c*(e^2*f - d^2*h)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I
*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) - (2
*b^2*c*(e^2*f - d^2*h)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2
*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) + (2*b^2*c*(e^2*f - d^2*h)^2*PolyL
og[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d
^2 - e^2])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 697

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[2*c*d - b*e, 0] &
& IGtQ[p, 0] &&  !(EqQ[m, 3] && NeQ[p, 1])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 858

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1668

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :
> With[{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(d + e*x)
^(m + q - 1)*((a + c*x^2)^(p + 1)/(c*e^(q - 1)*(m + q + 2*p + 1))), x] + Di
st[1/(c*e^q*(m + q + 2*p + 1)), Int[(d + e*x)^m*(a + c*x^2)^p*ExpandToSum[c
*e^q*(m + q + 2*p + 1)*Pq - c*f*(m + q + 2*p + 1)*(d + e*x)^q - f*(d + e*x)
^(q - 2)*(a*e^2*(m + q - 1) - c*d^2*(m + q + 2*p + 1) - 2*c*d*e*(m + q + p)
*x), x], x], x] /; GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, c, d,
 e, m, p}, x] && PolyQ[Pq, x] && NeQ[c*d^2 + a*e^2, 0] &&  !(EqQ[d, 0] && T
rue) &&  !(IGtQ[m, 0] && RationalQ[a, c, d, e] && (IntegerQ[p] || ILtQ[p +
1/2, 0]))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4841

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Dist[(a + b*ArcSin[c*x])^n, u, x] - Dist[b*c*
n, Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]),
 x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[p,
 0] && EqQ[e*g - 2*d*h, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4881

```
Int[ArcSin[(c_.)*(x_)]^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :
> With[{u = ExpandIntegrand[(d + e*x^2)^p*ArcSin[c*x]^n, RFx, x]}, Int[u, x
] /; SumQ[u]] /; FreeQ[{c, d, e}, x] && RationalFunctionQ[RFx, x] && IGtQ[n
, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 4883

```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - (2bc)\int \frac{\left(6eh(e^2f-d^2h)\,x-\frac{3(e^2f-d^2h)^2}{d+ex}+h^2(d+ex)^3\right)(a+b\arcsin(cx))}{3e^3\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{(2bc)\int \frac{\left(6eh(e^2f-d^2h)x-\frac{3(e^2f-d^2h)^2}{d+ex}+h^2(d+ex)^3\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3e^3}$$

$$= \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{(2bc)\int \left(\frac{a(-3e^4f^2+6d^2e^2fh-2d^4h^2+2deh(3e^2f-d^2h)x+6e^4fhx^2+4de^3h^2x^3+e^4h^2x^4)}{(d+ex)\sqrt{1-c^2x^2}}+\frac{b(-3e^4f^2+6d^2e^2fh-2d^4h^2+2deh}{}\right.}{3e^3}$$

$$= \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{(2abc)\int \frac{-3e^4f^2+6d^2e^2fh-2d^4h^2+2deh(3e^2f-d^2h)x+6e^4fhx^2+4de^3h^2x^3+e^4h^2x^4}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{3e^3} - \frac{(2b^2c)\int \frac{(-3e^4f^2+6d^2e^2fh-2d^4h^2+2deh(3e^2f-d^2h)x+6e^4fhx^2+4de^3h^2x^3+e^4h^2x^4)\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{3e^3}$$

$$= \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} + \frac{(2ab)\int \frac{-2d^2e^6h^2+3c^2(3e^8f^2-6d^2e^6fh+2d^4e^4h^2)-de^5h(4e^2h+c^2(18e^2f-7d^2h))x-e^6h(2e^2h+c^2(18e^2f-5d^2h))x^2-5c^2de^7h^2}{(d+ex)\sqrt{1-c^2x^2}}}{9ce^7} - \frac{(2b^2c)\int \left(\frac{d^3h^2\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{3eh(2e^2f-d^2h)x\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{3de^2h^2x^2\arcsin(cx)}{\sqrt{1-c^2x^2}}+\frac{e^3h^2x^3\arcsin(cx)}{\sqrt{1-c^2x^2}}-\frac{3(e^2f-d^2h)^2\arcsin}{(d+ex)\sqrt{1-c^2}}\right.}{3e^3}$$

$$= \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} + \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{(ab)\int \frac{3c^2e^7(3d^2e^2h^2-2c^2(3e^4f^2-6d^2e^2fh+2d^4h^2))+c^2de^8h(13e^2h+c^2(36e^2f-19d^2h))x+c^2e^9h(4e^2h+c^2(36e^2f-25d^2h))x}{(d+ex)\sqrt{1-c^2x^2}}}{9c^3e^{10}} - \frac{1}{3}(2b^2ch^2)\int \frac{x^3\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{(2b^2cd^3h^2)\int \frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{3e^3} - \frac{(2b^2cdh^2)\int \frac{x^2\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{e} + \frac{\left(2b^2c(e^2f-d^2h)^2\right)\int \frac{\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^3} - \frac{(2b^2ch(2e^2f-d^2h))\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{e^2}$$

$$= \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} + \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} + \frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} + \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} - \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} + \frac{(ab)\int \frac{-3c^4e^9(3d^2e^2h^2-2c^2(3e^4f^2-6d^2e^2fh+2d^4h^2))-3c^4de^{10}(2c^2d^2+3e^2)h^2x}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{9c^5e^{12}} - \frac{1}{9}(2b^2h^2)\int x^2\,dx - \frac{(4b^2h^2)\int \frac{x\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{9c} - \frac{(b^2dh^2)\int x\,dx}{e} - \frac{(b^2dh^2)\int \frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{ce} + \frac{\left(2b^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int \frac{x}{cd+e\sin(x)}\,dx, x, \arcsin(cx)\right)}{e^3} - \frac{(2b^2h(2e^2f-d^2h))\int 1\,dx}{e^2}$$

$$= -\frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 + \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\,\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} + \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} + \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\,\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} + \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} - \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{(4b^2h^2)\int 1\,dx}{9c^2} - \frac{(abd(2c^2d^2+3e^2)\,h^2)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3ce^3} + \frac{\left(2abc(e^2f-d^2h)^2\right)\int\frac{1}{(d+ex)\sqrt{1-c^2x^2}}\,dx}{e^3} + \frac{\left(4b^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{e^{ix}x}{ie+2cde^{ix}-iee^{2ix}}\,dx,x,\arcsin(cx)\right)}{e^3}$$

$$= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 + \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\,\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} + \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} - \frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} + \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\,\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} + \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} - \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} - \frac{\left(2abc(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{1}{-c^2d^2+e^2-x^2}\,dx,x,\frac{e+c^2dx}{\sqrt{1-c^2x^2}}\right)}{e^3} - \frac{\left(4ib^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cd-2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{\left(4ib^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{e^{ix}x}{2cd+2\sqrt{c^2d^2-e^2}-2iee^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2\sqrt{c^2d^2-e^2}}$$

$$
\begin{aligned}
&= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 \\
&+ \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\,\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} \\
&+ \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} - \frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} \\
&+ \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\,\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} \\
&+ \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} \\
&- \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} \\
&- \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} \\
&+ \frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{\left(2ib^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd-2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{\left(2ib^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\log\left(1-\frac{2iee^{ix}}{2cd+2\sqrt{c^2d^2-e^2}}\right)\,dx,x,\arcsin(cx)\right)}{e^3\sqrt{c^2d^2-e^2}}
\end{aligned}
$$

$$= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 + \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} + \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} - \frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} + \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} + \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} - \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} + \frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} - \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} + \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} + \frac{\left(2b^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd-2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^3\sqrt{c^2d^2-e^2}} - \frac{\left(2b^2c(e^2f-d^2h)^2\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{2iex}{2cd+2\sqrt{c^2d^2-e^2}}\right)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{e^3\sqrt{c^2d^2-e^2}}$$

$$
\begin{aligned}
&= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 \\
&+ \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} \\
&+ \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} - \frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} \\
&+ \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} \\
&+ \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} \\
&- \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} \\
&- \frac{(e^2f-d^2h)^2\,(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} \\
&+ \frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{2b^2c(e^2f-d^2h)^2\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{2b^2c(e^2f-d^2h)^2\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.95 (sec) , antiderivative size = 526, normalized size of antiderivative = 0.57

$$\int \frac{(ef+2dhx+ehx^2)^2 (a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \frac{h(2e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} + \frac{dh^2x^2(a+b\arcsin(cx))^2}{e} + \frac{1}{3}h^2x^3(a+b\arcsin(cx))^2 - \frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)} - \frac{2bh^2\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3} - \frac{2bh(2e^2f-d^2h)\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e^2} - \frac{bdh^2\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)}{2e} + \frac{2bc(e^2f-d^2h)^2\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{PolyLog}\left(2\right.\right.}{e^3\sqrt{c^2d^2-e^2}}$$

```
[In] Integrate[((e*f + 2*d*h*x + e*h*x^2)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x
]
```

```
[Out] (h*(2*e^2*f - d^2*h)*x*(a + b*ArcSin[c*x])^2)/e^2 + (d*h^2*x^2*(a + b*ArcSi
n[c*x])^2)/e + (h^2*x^3*(a + b*ArcSin[c*x])^2)/3 - ((e^2*f - d^2*h)^2*(a +
b*ArcSin[c*x])^2)/(e^3*(d + e*x)) - (2*b*h^2*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c
^2*x^2) + b*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[
c*x]))/(27*c^3) - (2*b*h*(2*e^2*f - d^2*h)*(b*x - (Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/c))/e^2 - (b*d*h^2*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/(2*e) + (2*b*c*(e^2*f - d^2
*h)^2*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) +
Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2
 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2
])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/(
e^3*Sqrt[c^2*d^2 - e^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2173 vs. 2(886) = 1772.

Time = 3.88 (sec) , antiderivative size = 2174, normalized size of antiderivative = 2.36

method	result	size
parts	Expression too large to display	2174
derivativedivides	Expression too large to display	2208
default	Expression too large to display	2208

```
[In] int((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURNV
ERBOSE)
```

```
[Out] a^2*(h/e^2*(1/3*x^3*e^2*h+x^2*d*e*h-d^2*h*x+2*e^2*f*x)-(d^4*h^2-2*d^2*e^2*f
*h+e^4*f^2)/e^3/(e*x+d))+b^2/c*(1/8/c*d*h^2*(2*I*arcsin(c*x)+2*arcsin(c*x)^
2-1)/e*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-1/8*(c*x+I*(-c^2*x^2+1)^(1/
2))*h*(4*c^2*d^2*h-8*c^2*e^2*f-e^2*h)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2
/e^2+4*I*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f*h*c^2*d^
2+1/8*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*d*h^2*(-2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)/c/e-(d^4*h^2-2*d^2*e^2*f*h+e^4*f^2)*arcsin(c*x)^2*c^2/e^3/(c
*e*x+c*d)-2*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((-I*d
*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2
)^(1/2)))*d^4*h^2+4*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln
((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d
^2+e^2)^(1/2)))*d^2*f*h-2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*e*c^2*arcsin(c
*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(
-c^2*d^2+e^2)^(1/2)))*f^2+2*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*c^2*arcs
in(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c
+(-c^2*d^2+e^2)^(1/2)))*d^4*h^2-4*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*c^2*
arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I
*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*f*h+2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*e*
c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2)
)/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f^2+2*I*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*
dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-
c^2*d^2+e^2)^(1/2)))*f^2*c^2*e+2*I*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*d
ilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c
^2*d^2+e^2)^(1/2)))*h^2*c^2*d^4-2*I*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*
dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^
2*d^2+e^2)^(1/2)))*h^2*c^2*d^4-1/8*(-I*(-c^2*x^2+1)^(1/2)+c*x)*h*(4*c^2*d^2
*h-8*c^2*e^2*f-e^2*h)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/e^2-4*I*(-c^2*d
^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-
c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*f*h*c^2*d^2-2*I*(-c^2*d^
2+e^2)^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f^2*c^2*e-1/18*h^2*arcsin(c*x
)/c^2*cos(3*arcsin(c*x))-1/108*h^2*(9*arcsin(c*x)^2-2)/c^2*sin(3*arcsin(c*x
)))+2*a*b/c*(1/3*c*arcsin(c*x)*h^2*x^3+c*arcsin(c*x)/e*d*h^2*x^2-arcsin(c*x
)/e^2*h^2*d^2*c*x+2*arcsin(c*x)*h*f*c*x-c^2*arcsin(c*x)/e^3/(c*e*x+c*d)*d^4
*h^2+2*c^2*arcsin(c*x)/e/(c*e*x+c*d)*d^2*f*h-c^2*arcsin(c*x)*e/(c*e*x+c*d)*
```

```
f^2-1/3/c^2/e^3*(e^3*h^2*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^
(1/2))+3*c*d*h^2*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+3*c^2*d^
2*e*h^2*(-c^2*x^2+1)^(1/2)-6*c^2*e^3*f*h*(-c^2*x^2+1)^(1/2)+3*c^4*(d^4*h^2-
2*d^2*e^2*f*h+e^4*f^2)/e/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^
2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*
(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))))
```

Fricas [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b\arcsin(cx))^2}{(d + ex)^2} dx = \int \frac{(ehx^2 + 2\,dhx + ef)^2 (b\arcsin(cx) + a)^2}{(ex + d)^2} dx$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorith
m="fricas")
```

```
[Out] integral((a^2*e^2*h^2*x^4 + 4*a^2*d*e*h^2*x^3 + 4*a^2*d*e*f*h*x + a^2*e^2*f
^2 + 2*(a^2*e^2*f*h + 2*a^2*d^2*h^2)*x^2 + (b^2*e^2*h^2*x^4 + 4*b^2*d*e*h^2
*x^3 + 4*b^2*d*e*f*h*x + b^2*e^2*f^2 + 2*(b^2*e^2*f*h + 2*b^2*d^2*h^2)*x^2)
*arcsin(c*x)^2 + 2*(a*b*e^2*h^2*x^4 + 4*a*b*d*e*h^2*x^3 + 4*a*b*d*e*f*h*x +
 a*b*e^2*f^2 + 2*(a*b*e^2*f*h + 2*a*b*d^2*h^2)*x^2)*arcsin(c*x))/(e^2*x^2 +
 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b\arcsin(cx))^2}{(d + ex)^2} dx = \int \frac{(a + b\operatorname{asin}(cx))^2 (2dhx + ef + ehx^2)^2}{(d + ex)^2} dx$$

```
[In] integrate((e*h*x**2+2*d*h*x+e*f)**2*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)**2/(d + e*x)**2, x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \text{Exception raised: ValueError}$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorith
m="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume?`
for mor
```

Giac [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \int \frac{(ehx^2 + 2\,dhx + ef)^2 (b \arcsin(cx) + a)^2}{(ex + d)^2} dx$$

```
[In] integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorith
m="giac")
```

```
[Out] integrate((e*h*x^2 + 2*d*h*x + e*f)^2*(b*arcsin(c*x) + a)^2/(e*x + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \int \frac{(a + b\,\mathrm{asin}(c\,x))^2 (e\,h\,x^2 + 2\,d\,h\,x + e\,f)^2}{(d + e\,x)^2} dx$$

```
[In] int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2, x)
```

3.122 $\int x^3 \arcsin(a+bx)\,dx$

Optimal result

Integrand size = 10, antiderivative size = 137

$$\int x^3 \arcsin(a+bx)\,dx = -\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b}-\frac{\left(4a(16+19a^2)-(9+26a^2)(a+bx)\right)\sqrt{1-(a+bx)^2}}{96b^4}-\frac{(3+24a^2+8a^4)\arcsin(a+bx)}{32b^4}+\frac{1}{4}x^4\arcsin(a+bx)$$

```
[Out] -1/32*(8*a^4+24*a^2+3)*arcsin(b*x+a)/b^4+1/4*x^4*arcsin(b*x+a)-7/48*a*x^2*(
1-(b*x+a)^2)^(1/2)/b^2+1/16*x^3*(1-(b*x+a)^2)^(1/2)/b-1/96*(4*a*(19*a^2+16)
-(26*a^2+9)*(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^4
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4889, 4827, 757, 847, 794, 222}

$$\int x^3 \arcsin(a+bx)\,dx = -\frac{\left(4a(19a^2+16)-(26a^2+9)(a+bx)\right)\sqrt{1-(a+bx)^2}}{96b^4}-\frac{(8a^4+24a^2+3)\arcsin(a+bx)}{32b^4}+\frac{1}{4}x^4\arcsin(a+bx)-\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b}$$

```
[In] Int[x^3*ArcSin[a + b*x],x]
```

```
[Out] (-7*a*x^2*Sqrt[1 - (a + b*x)^2])/(48*b^2) + (x^3*Sqrt[1 - (a + b*x)^2])/(16
*b) - ((4*a*(16 + 19*a^2) - (9 + 26*a^2)*(a + b*x))*Sqrt[1 - (a + b*x)^2])/
```

```
(96*b^4) - ((3 + 24*a^2 + 8*a^4)*ArcSin[a + b*x])/(32*b^4) + (x^4*ArcSin[a
+ b*x])/4
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 847

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 2))
), x] + Dist[1/(c*(m + 2*p + 2)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p*Simp[
c*d*f*(m + 2*p + 2) - a*e*g*m + c*(e*f*(m + 2*p + 2) + d*g*m)*x, x], x], x]
 /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[m, 0] &
& NeQ[m + 2*p + 2, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^3 \arcsin(x)\,dx, x, a+bx\right)}{b}\\
&= \frac{1}{4}x^4\arcsin(a+bx)-\frac{1}{4}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^4}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= \frac{x^3\sqrt{1-(a+bx)^2}}{16b}+\frac{1}{4}x^4\arcsin(a+bx)\\
&\quad+\frac{1}{16}\text{Subst}\left(\int \frac{\left(-\frac{3+4a^2}{b^2}+\frac{7ax}{b^2}\right)\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b}+\frac{1}{4}x^4\arcsin(a+bx)\\
&\quad-\frac{1}{48}\text{Subst}\left(\int \frac{\left(-\frac{a(23+12a^2)}{b^3}+\frac{(9+26a^2)x}{b^3}\right)\left(-\frac{a}{b}+\frac{x}{b}\right)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b}\\
&\quad-\frac{\left(4a(16+19a^2)-(9+26a^2)(a+bx)\right)\sqrt{1-(a+bx)^2}}{96b^4}\\
&\quad+\frac{1}{4}x^4\arcsin(a+bx)-\frac{(3+24a^2+8a^4)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{32b^4}\\
&= -\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b}\\
&\quad-\frac{\left(4a(16+19a^2)-(9+26a^2)(a+bx)\right)\sqrt{1-(a+bx)^2}}{96b^4}\\
&\quad-\frac{(3+24a^2+8a^4)\arcsin(a+bx)}{32b^4}+\frac{1}{4}x^4\arcsin(a+bx)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.72

$$\int x^3 \arcsin(a+bx)\,dx$$
$$= \frac{\sqrt{1-a^2-2abx-b^2x^2}(-50a^3+9bx+26a^2bx+6b^3x^3-a(55+14b^2x^2))-3(3+24a^2+8a^4-8b^4x^4)\,\mathrm{a}}{96b^4}$$

```
[In] Integrate[x^3*ArcSin[a + b*x],x]
```

```
[Out] (Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-50*a^3 + 9*b*x + 26*a^2*b*x + 6*b^3*x^
3 - a*(55 + 14*b^2*x^2)) - 3*(3 + 24*a^2 + 8*a^4 - 8*b^4*x^4)*ArcSin[a + b*
x])/(96*b^4)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.55

method	result
derivativedivides	$\frac{-\arcsin(bx+a)a^3(bx+a)+\frac{3\arcsin(bx+a)a^2(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)^3+\frac{\arcsin(bx+a)(bx+a)^4}{4}+\frac{(bx+a)^3\sqrt{1-(bx+a)^2}}{16}+}{}$
default	$\frac{-\arcsin(bx+a)a^3(bx+a)+\frac{3\arcsin(bx+a)a^2(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)^3+\frac{\arcsin(bx+a)(bx+a)^4}{4}+\frac{(bx+a)^3\sqrt{1-(bx+a)^2}}{16}+}{}$
parts	$\frac{x^4\arcsin(bx+a)}{4}-\frac{b\left(-\frac{x^3\sqrt{-b^2x^2-2abx-a^2+1}}{4b^2}-\frac{7a\left(-\frac{x^2\sqrt{-b^2x^2-2abx-a^2+1}}{3b^2}-\frac{5a\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-b}}{}\right.}{}\right.}{}\right.}{}\right.}{}$

[In] int(x^3*arcsin(b*x+a),x,method=_RETURNVERBOSE)

[Out] 1/b^4*(-arcsin(b*x+a)*a^3*(b*x+a)+3/2*arcsin(b*x+a)*a^2*(b*x+a)^2-arcsin(b*x+a)*a*(b*x+a)^3+1/4*arcsin(b*x+a)*(b*x+a)^4+1/16*(b*x+a)^3*(1-(b*x+a)^2)^(1/2)+3/32*(b*x+a)*(1-(b*x+a)^2)^(1/2)-3/32*arcsin(b*x+a)-a^3*(1-(b*x+a)^2)^(1/2)-3/2*a^2*(-1/2*(b*x+a)*(1-(b*x+a)^2)^(1/2)+1/2*arcsin(b*x+a))+a*(-1/3*(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-2/3*(1-(b*x+a)^2)^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.68

$$\int x^3 \arcsin(a+bx)\,dx$$
$$= \frac{3\,(8\,b^4x^4 - 8\,a^4 - 24\,a^2 - 3)\arcsin\left(bx+a\right) + (6\,b^3x^3 - 14\,ab^2x^2 - 50\,a^3 + (26\,a^2+9)bx - 55\,a)\sqrt{-b^2x^2}}{96\,b^4}$$

```
[In] integrate(x^3*arcsin(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/96*(3*(8*b^4*x^4 - 8*a^4 - 24*a^2 - 3)*arcsin(b*x + a) + (6*b^3*x^3 - 14*
a*b^2*x^2 - 50*a^3 + (26*a^2 + 9)*b*x - 55*a)*sqrt(-b^2*x^2 - 2*a*b*x - a^2
 + 1))/b^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 255 vs. $2(119) = 238$.

Time = 0.33 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.86

$$\int x^3 \arcsin(a+bx)\,dx$$
$$= \begin{cases} -\frac{a^4\operatorname{asin}(a+bx)}{4b^4} - \frac{25a^3\sqrt{-a^2-2abx-b^2x^2+1}}{48b^4} + \frac{13a^2x\sqrt{-a^2-2abx-b^2x^2+1}}{48b^3} - \frac{3a^2\operatorname{asin}(a+bx)}{4b^4} - \frac{7ax^2\sqrt{-a^2-2abx-b^2x^2+1}}{48b^2} - \frac{55a}{} \\ \frac{x^4\operatorname{asin}(a)}{4} \end{cases}$$

```
[In] integrate(x**3*asin(b*x+a),x)
```

```
[Out] Piecewise((-a**4*asin(a + b*x)/(4*b**4) - 25*a**3*sqrt(-a**2 - 2*a*b*x - b*
*2*x**2 + 1)/(48*b**4) + 13*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(4
8*b**3) - 3*a**2*asin(a + b*x)/(4*b**4) - 7*a*x**2*sqrt(-a**2 - 2*a*b*x - b
**2*x**2 + 1)/(48*b**2) - 55*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(96*b*
*4) + x**4*asin(a + b*x)/4 + x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(16
*b) + 3*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(32*b**3) - 3*asin(a + b*x)
/(32*b**4), Ne(b, 0)), (x**4*asin(a)/4, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 333 vs. $2(120) = 240$.

Time = 0.28 (sec) , antiderivative size = 333, normalized size of antiderivative = 2.43

$$\int x^3 \arcsin(a+bx)\,dx = \frac{1}{4}x^4 \arcsin(bx+a) + \frac{1}{96}\left(\frac{6\sqrt{-b^2x^2-2abx-a^2+1}x^3}{b^2} - \frac{14\sqrt{-b^2x^2-2abx-a^2+1}ax^2}{b^3} + \frac{105a^4\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^5}\right.$$

```
[In] integrate(x^3*arcsin(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arcsin(b*x + a) + 1/96*(6*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x^3/b^
2 - 14*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a*x^2/b^3 + 105*a^4*arcsin(-(b^2*
x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^5 + 35*sqrt(-b^2*x^2 - 2*a*b*x -
a^2 + 1)*a^2*x/b^4 - 90*(a^2 - 1)*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 -
(a^2 - 1)*b^2))/b^5 - 105*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a^3/b^5 - 9*sq
rt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*x/b^4 + 9*(a^2 - 1)^2*arcsin(-(b
^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^5 + 55*sqrt(-b^2*x^2 - 2*a*b*x
 - a^2 + 1)*(a^2 - 1)*a/b^5)*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 284 vs. $2(120) = 240$.

Time = 0.30 (sec) , antiderivative size = 284, normalized size of antiderivative = 2.07

$$\int x^3 \arcsin(a+bx)\,dx = -\frac{(bx+a)a^3\arcsin(bx+a)}{b^4} - \frac{\left((bx+a)^2-1\right)(bx+a)a\arcsin(bx+a)}{b^4} + \frac{3\left((bx+a)^2-1\right)a^2\arcsin(bx+a)}{2\,b^4} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a^2}{4\,b^4} - \frac{\sqrt{-(bx+a)^2+1}a^3}{b^4} + \frac{\left((bx+a)^2-1\right)^2\arcsin(bx+a)}{4\,b^4} - \frac{(bx+a)a\arcsin(bx+a)}{b^4} + \frac{3\,a^2\arcsin(bx+a)}{4\,b^4} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a)}{16\,b^4} + \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}a}{3\,b^4} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)}{2\,b^4} + \frac{5\sqrt{-(bx+a)^2+1}(bx+a)}{32\,b^4} - \frac{\sqrt{-(bx+a)^2+1}a}{b^4} + \frac{5\arcsin(bx+a)}{32\,b^4}$$

```
[In] integrate(x^3*arcsin(b*x+a),x, algorithm="giac")
```

```
[Out] -(b*x + a)*a^3*arcsin(b*x + a)/b^4 - ((b*x + a)^2 - 1)*(b*x + a)*a*arcsin(b
*x + a)/b^4 + 3/2*((b*x + a)^2 - 1)*a^2*arcsin(b*x + a)/b^4 + 3/4*sqrt(-(b*
x + a)^2 + 1)*(b*x + a)*a^2/b^4 - sqrt(-(b*x + a)^2 + 1)*a^3/b^4 + 1/4*((b*
x + a)^2 - 1)^2*arcsin(b*x + a)/b^4 - (b*x + a)*a*arcsin(b*x + a)/b^4 + 3/4
*a^2*arcsin(b*x + a)/b^4 - 1/16*(-(b*x + a)^2 + 1)^(3/2)*(b*x + a)/b^4 + 1/
3*(-(b*x + a)^2 + 1)^(3/2)*a/b^4 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)/b^
4 + 5/32*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^4 - sqrt(-(b*x + a)^2 + 1)*a/b^
4 + 5/32*arcsin(b*x + a)/b^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \arcsin(a+bx)\,dx = \int x^3\,\mathrm{asin}(a+b\,x)\,dx$$

```
[In] int(x^3*asin(a + b*x),x)
```

```
[Out] int(x^3*asin(a + b*x), x)
```

3.123 $\int x^2 \arcsin(a+bx)\,dx$

Optimal result

Integrand size = 10, antiderivative size = 94

$$\int x^2 \arcsin(a+bx)\,dx = \frac{x^2\sqrt{1-(a+bx)^2}}{9b}+\frac{(4+11a^2-5abx)\sqrt{1-(a+bx)^2}}{18b^3}+\frac{a(3+2a^2)\arcsin(a+bx)}{6b^3}+\frac{1}{3}x^3\arcsin(a+bx)$$

```
[Out] 1/6*a*(2*a^2+3)*arcsin(b*x+a)/b^3+1/3*x^3*arcsin(b*x+a)+1/9*x^2*(1-(b*x+a)^
2)^(1/2)/b+1/18*(-5*a*b*x+11*a^2+4)*(1-(b*x+a)^2)^(1/2)/b^3
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4889, 4827, 757, 794, 222}

$$\int x^2 \arcsin(a+bx)\,dx = \frac{a(2a^2+3)\arcsin(a+bx)}{6b^3}+\frac{(11a^2-5abx+4)\sqrt{1-(a+bx)^2}}{18b^3}+\frac{1}{3}x^3\arcsin(a+bx)+\frac{x^2\sqrt{1-(a+bx)^2}}{9b}$$

```
[In] Int[x^2*ArcSin[a + b*x],x]
```

```
[Out] (x^2*Sqrt[1 - (a + b*x)^2])/(9*b) + ((4 + 11*a^2 - 5*a*b*x)*Sqrt[1 - (a + b
*x)^2])/(18*b^3) + (a*(3 + 2*a^2)*ArcSin[a + b*x])/(6*b^3) + (x^3*ArcSin[a
+ b*x])/3
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 794

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*((a + c*x^2)^(p
+ 1)/(2*c*(p + 1)*(2*p + 3))), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^2 \arcsin(x)\,dx, x, a+bx\right)}{b}$$

$$= \frac{1}{3}x^3\arcsin(a+bx) - \frac{1}{3}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^3}{\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= \frac{x^2\sqrt{1-(a+bx)^2}}{9b} + \frac{1}{3}x^3\arcsin(a+bx) + \frac{1}{9}\text{Subst}\left(\int \frac{\left(-\frac{2+3a^2}{b^2}+\frac{5ax}{b^2}\right)\left(-\frac{a}{b}+\frac{x}{b}\right)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= \frac{x^2\sqrt{1-(a+bx)^2}}{9b} + \frac{(4+11a^2-5abx)\sqrt{1-(a+bx)^2}}{18b^3} + \frac{1}{3}x^3\arcsin(a+bx) + \frac{(a(3+2a^2))\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{6b^3}$$

$$= \frac{x^2\sqrt{1-(a+bx)^2}}{9b} + \frac{(4+11a^2-5abx)\sqrt{1-(a+bx)^2}}{18b^3} + \frac{a(3+2a^2)\arcsin(a+bx)}{6b^3} + \frac{1}{3}x^3\arcsin(a+bx)$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.82

$$\int x^2\arcsin(a+bx)\,dx = \frac{\sqrt{1-a^2-2abx-b^2x^2}(4+11a^2-5abx+2b^2x^2)+(9a+6a^3+6b^3x^3)\arcsin(a+bx)}{18b^3}$$

```
[In] Integrate[x^2*ArcSin[a + b*x],x]
[Out] (Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(4 + 11*a^2 - 5*a*b*x + 2*b^2*x^2) + (9*
a + 6*a^3 + 6*b^3*x^3)*ArcSin[a + b*x])/(18*b^3)
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.46

method	result
derivativedivides	$\frac{\arcsin(bx+a)a^2(bx+a)-\arcsin(bx+a)a(bx+a)^2+\frac{\arcsin(bx+a)(bx+a)^3}{3}+\frac{(bx+a)^2\sqrt{1-(bx+a)^2}}{9}+\frac{2\sqrt{1-(bx+a)^2}}{9}+a^2\sqrt{1-(bx \cdots}}{b^3}$
default	$\frac{\arcsin(bx+a)a^2(bx+a)-\arcsin(bx+a)a(bx+a)^2+\frac{\arcsin(bx+a)(bx+a)^3}{3}+\frac{(bx+a)^2\sqrt{1-(bx+a)^2}}{9}+\frac{2\sqrt{1-(bx+a)^2}}{9}+a^2\sqrt{1-(bx \cdots}}{b^3}$
parts	$\frac{x^3\arcsin(bx+a)}{3}-\frac{b\left(-\frac{x^2\sqrt{-b^2x^2-2abx-a^2+1}}{3b^2}-\frac{5a\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\cdots\right)}{\cdots}\right)}{2b}\cdots\right)}{3b\cdots}\cdots\right)}{\cdots}$

```
[In] int(x^2*arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(arcsin(b*x+a)*a^2*(b*x+a)-arcsin(b*x+a)*a*(b*x+a)^2+1/3*arcsin(b*x+a
)*(b*x+a)^3+1/9*(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+2/9*(1-(b*x+a)^2)^(1/2)+a^2*(
1-(b*x+a)^2)^(1/2)+a*(-1/2*(b*x+a)*(1-(b*x+a)^2)^(1/2)+1/2*arcsin(b*x+a)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.79

$$\int x^2 \arcsin(a+bx)\,dx$$
$$= \frac{3\,(2\,b^3x^3+2\,a^3+3\,a)\arcsin\,(bx+a)+(2\,b^2x^2-5\,abx+11\,a^2+4)\sqrt{-b^2x^2-2\,abx-a^2+1}}{18\,b^3}$$

```
[In] integrate(x^2*arcsin(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/18*(3*(2*b^3*x^3 + 2*a^3 + 3*a)*arcsin(b*x + a) + (2*b^2*x^2 - 5*a*b*x +
11*a^2 + 4)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b^3
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 170 vs. $2(83) = 166$.

Time = 0.24 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.81

$$\int x^2 \arcsin(a+bx)\,dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}(a+bx)}{3b^3} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1}}{18b^3} - \frac{5ax\sqrt{-a^2-2abx-b^2x^2+1}}{18b^2} + \frac{a\operatorname{asin}(a+bx)}{2b^3} + \frac{x^3\operatorname{asin}(a+bx)}{3} + \frac{x^2\sqrt{-a^2-2abx-b^2x^2+1}}{9b} \\ \frac{x^3\operatorname{asin}(a)}{3} \end{cases}$$

```
[In] integrate(x**2*asin(b*x+a),x)
```

```
[Out] Piecewise((a**3*asin(a + b*x)/(3*b**3) + 11*a**2*sqrt(-a**2 - 2*a*b*x - b**
2*x**2 + 1)/(18*b**3) - 5*a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(18*b**
2) + a*asin(a + b*x)/(2*b**3) + x**3*asin(a + b*x)/3 + x**2*sqrt(-a**2 - 2*
a*b*x - b**2*x**2 + 1)/(9*b) + 2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(9*b
**3), Ne(b, 0)), (x**3*asin(a)/3, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 220 vs. $2(82) = 164$.

Time = 0.27 (sec) , antiderivative size = 220, normalized size of antiderivative = 2.34

$$\int x^2 \arcsin(a+bx)\,dx = \frac{1}{3}x^3 \arcsin(bx+a)$$
$$+ \frac{1}{18}b\left(\frac{2\sqrt{-b^2x^2-2\,abx-a^2+1}x^2}{b^2} - \frac{15\,a^3\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^4} - \frac{5\sqrt{-b^2x^2-2\,abx-a^2+1}ax}{b^3} + \right.$$

```
[In] integrate(x^2*arcsin(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arcsin(b*x + a) + 1/18*b*(2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x^2/
b^2 - 15*a^3*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^4 - 5*s
qrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a*x/b^3 + 9*(a^2 - 1)*a*arcsin(-(b^2*x +
a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^4 + 15*sqrt(-b^2*x^2 - 2*a*b*x - a^2
+ 1)*a^2/b^4 - 4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)/b^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 173 vs. 2(82) = 164.

Time = 0.29 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.84

$$\int x^2 \arcsin(a+bx)\,dx = \frac{(bx+a)a^2 \arcsin(bx+a)}{b^3} + \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)}{3\,b^3} - \frac{\left((bx+a)^2-1\right)a\arcsin(bx+a)}{b^3} - \frac{\sqrt{-(bx+a)^2+1}(bx+a)a}{2\,b^3} + \frac{\sqrt{-(bx+a)^2+1}a^2}{b^3} + \frac{(bx+a)\arcsin(bx+a)}{3\,b^3} - \frac{a\arcsin(bx+a)}{2\,b^3} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{9\,b^3} + \frac{\sqrt{-(bx+a)^2+1}}{3\,b^3}$$

```
[In] integrate(x^2*arcsin(b*x+a),x, algorithm="giac")
```

```
[Out] (b*x + a)*a^2*arcsin(b*x + a)/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcsin(
b*x + a)/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)/b^3 - 1/2*sqrt(-(b*x + a
)^2 + 1)*(b*x + a)*a/b^3 + sqrt(-(b*x + a)^2 + 1)*a^2/b^3 + 1/3*(b*x + a)*a
rcsin(b*x + a)/b^3 - 1/2*a*arcsin(b*x + a)/b^3 - 1/9*(-(b*x + a)^2 + 1)^(3/
2)/b^3 + 1/3*sqrt(-(b*x + a)^2 + 1)/b^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)\,dx = \int x^2 \,\mathrm{asin}(a+b\,x)\,dx$$

```
[In] int(x^2*asin(a + b*x),x)
```

```
[Out] int(x^2*asin(a + b*x), x)
```

3.124 $\int x \arcsin(a+bx)\,dx$

Optimal result

Integrand size = 8, antiderivative size = 80

$$\int x \arcsin(a+bx)\,dx = -\frac{3a\sqrt{1-(a+bx)^2}}{4b^2}+\frac{x\sqrt{1-(a+bx)^2}}{4b} -\frac{(1+2a^2)\arcsin(a+bx)}{4b^2}+\frac{1}{2}x^2\arcsin(a+bx)$$

```
[Out] -1/4*(2*a^2+1)*arcsin(b*x+a)/b^2+1/2*x^2*arcsin(b*x+a)-3/4*a*(1-(b*x+a)^2)^
(1/2)/b^2+1/4*x*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4889, 4827, 757, 655, 222}

$$\int x \arcsin(a+bx)\,dx = -\frac{(2a^2+1)\arcsin(a+bx)}{4b^2}+\frac{1}{2}x^2\arcsin(a+bx) -\frac{3a\sqrt{1-(a+bx)^2}}{4b^2}+\frac{x\sqrt{1-(a+bx)^2}}{4b}$$

```
[In] Int[x*ArcSin[a + b*x],x]
```

```
[Out] (-3*a*Sqrt[1 - (a + b*x)^2])/(4*b^2) + (x*Sqrt[1 - (a + b*x)^2])/(4*b) - ((
1 + 2*a^2)*ArcSin[a + b*x])/(4*b^2) + (x^2*ArcSin[a + b*x])/2
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)\arcsin(x)\,dx, x, a+bx\right)}{b}\\
&= \frac{1}{2}x^2\arcsin(a+bx)-\frac{1}{2}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= \frac{x\sqrt{1-(a+bx)^2}}{4b}+\frac{1}{2}x^2\arcsin(a+bx)+\frac{1}{4}\text{Subst}\left(\int \frac{-\frac{1+2a^2}{b^2}+\frac{3ax}{b^2}}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{3a\sqrt{1-(a+bx)^2}}{4b^2}+\frac{x\sqrt{1-(a+bx)^2}}{4b}+\frac{1}{2}x^2\arcsin(a+bx)\\
&\quad -\frac{(1+2a^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{4b^2}
\end{aligned}
$$

$$= -\frac{3a\sqrt{1-(a+bx)^2}}{4b^2} + \frac{x\sqrt{1-(a+bx)^2}}{4b} - \frac{(1+2a^2)\arcsin(a+bx)}{4b^2} + \frac{1}{2}x^2\arcsin(a+bx)$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.78

$$\int x\arcsin(a+bx)\,dx = \frac{(-3a+bx)\sqrt{1-a^2-2abx-b^2x^2}+(-1-2a^2+2b^2x^2)\arcsin(a+bx)}{4b^2}$$

```
[In] Integrate[x*ArcSin[a + b*x],x]
[Out] ((-3*a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + (-1 - 2*a^2 + 2*b^2*x^2)*
ArcSin[a + b*x])/(4*b^2)
```

Maple [A] (verified)

Time = 0.05 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.99

method	result
derivativedivides	$\frac{\frac{\arcsin(bx+a)(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)+\frac{(bx+a)\sqrt{1-(bx+a)^2}}{4}-\frac{\arcsin(bx+a)}{4}-a\sqrt{1-(bx+a)^2}}{b^2}$
default	$\frac{\frac{\arcsin(bx+a)(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)+\frac{(bx+a)\sqrt{1-(bx+a)^2}}{4}-\frac{\arcsin(bx+a)}{4}-a\sqrt{1-(bx+a)^2}}{b^2}$
parts	$\frac{x^2\arcsin(bx+a)}{2}-\frac{b\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{b\sqrt{b^2}}\right)}{2b}+\frac{(-a^2+1}{}\right.}{2}$

```
[In] int(x*arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] 1/b^2*(1/2*arcsin(b*x+a)*(b*x+a)^2-arcsin(b*x+a)*a*(b*x+a)+1/4*(b*x+a)*(1-(
b*x+a)^2)^(1/2)-1/4*arcsin(b*x+a)-a*(1-(b*x+a)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.72

$$\int x\arcsin(a+bx)\,dx = \frac{(2\,b^2x^2-2\,a^2-1)\arcsin\left(bx+a\right)+\sqrt{-b^2x^2-2\,abx-a^2+1}(bx-3\,a)}{4\,b^2}$$

```
[In] integrate(x*arcsin(b*x+a),x, algorithm="fricas")
[Out] 1/4*((2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a) + sqrt(-b^2*x^2 - 2*a*b*x - a^
2 + 1)*(b*x - 3*a))/b^2
```

Sympy [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.30

$$\int x\arcsin(a+bx)\,dx = \begin{cases} -\frac{a^2\operatorname{asin}\left(a+bx\right)}{2b^2}-\frac{3a\sqrt{-a^2-2abx-b^2x^2+1}}{4b^2}+\frac{x^2\operatorname{asin}\left(a+bx\right)}{2}+\frac{x\sqrt{-a^2-2abx-b^2x^2+1}}{4b}-\frac{\operatorname{asin}\left(a+bx\right)}{4b^2} & \text{for } b\neq 0 \\ \frac{x^2\operatorname{asin}\left(a\right)}{2} & \text{otherwise} \end{cases}$$

```
[In] integrate(x*asin(b*x+a),x)
[Out] Piecewise((-a**2*asin(a + b*x)/(2*b**2) - 3*a*sqrt(-a**2 - 2*a*b*x - b**2*x
**2 + 1)/(4*b**2) + x**2*asin(a + b*x)/2 + x*sqrt(-a**2 - 2*a*b*x - b**2*x*
*2 + 1)/(4*b) - asin(a + b*x)/(4*b**2), Ne(b, 0)), (x**2*asin(a)/2, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 153 vs. 2(68) = 136.

Time = 0.27 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.91

$$\int x\arcsin(a+bx)\,dx = \frac{1}{2}\,x^2\arcsin\left(bx+a\right) + \frac{1}{4}\,b\left(\frac{3\,a^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^3}+\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}x}{b^2}-\frac{(a^2-1)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^3}\right.$$

```
[In] integrate(x*arcsin(b*x+a),x, algorithm="maxima")
[Out] 1/2*x^2*arcsin(b*x + a) + 1/4*b*(3*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 -
 (a^2 - 1)*b^2))/b^3 + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x/b^2 - (a^2 - 1)
*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^3 - 3*sqrt(-b^2*x^2
 - 2*a*b*x - a^2 + 1)*a/b^3)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.14

$$\int x \arcsin(a+bx)\,dx = -\frac{(bx+a)a\arcsin(bx+a)}{b^2} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)}{4\,b^2} - \frac{\sqrt{-(bx+a)^2+1}a}{b^2} + \frac{\arcsin(bx+a)}{4\,b^2}$$

```
[In] integrate(x*arcsin(b*x+a),x, algorithm="giac")
```

```
[Out] -(b*x + a)*a*arcsin(b*x + a)/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)/b^
2 + 1/4*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^2 - sqrt(-(b*x + a)^2 + 1)*a/b^2
 + 1/4*arcsin(b*x + a)/b^2
```

Mupad [F(-1)]

Timed out.

$$\int x \arcsin(a+bx)\,dx = \int x\,\mathrm{asin}(a+b\,x)\;dx$$

```
[In] int(x*asin(a + b*x),x)
```

```
[Out] int(x*asin(a + b*x), x)
```

3.125 $\int \arcsin(a+bx)\,dx$

Optimal result

Integrand size = 6, antiderivative size = 35

$$\int \arcsin(a+bx)\,dx=\frac{\sqrt{1-(a+bx)^2}}{b}+\frac{(a+bx)\arcsin(a+bx)}{b}$$

```
[Out] (b*x+a)*arcsin(b*x+a)/b+(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4715, 267}

$$\int \arcsin(a+bx)\,dx=\frac{(a+bx)\arcsin(a+bx)}{b}+\frac{\sqrt{1-(a+bx)^2}}{b}$$

```
[In] Int[ArcSin[a + b*x],x]
```

```
[Out] Sqrt[1 - (a + b*x)^2]/b + ((a + b*x)*ArcSin[a + b*x])/b
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}(\int \arcsin(x)\,dx, x, a+bx)}{b}\\ &= \frac{(a+bx)\arcsin(a+bx)}{b} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\ &= \frac{\sqrt{1-(a+bx)^2}}{b} + \frac{(a+bx)\arcsin(a+bx)}{b}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 154 vs. 2(35) = 70.

Time = 0.36 (sec) , antiderivative size = 154, normalized size of antiderivative = 4.40

$$\int \arcsin(a+bx)\,dx = x\arcsin(a+bx) + \frac{2b\sqrt{1-a^2-2abx-b^2x^2} + 2ab\arctan\left(\frac{\sqrt{-b^2}x-\sqrt{1-a^2-2abx-b^2x^2}}{a}\right) + a\sqrt{-b^2}\log\left(-1+2abx+2b^2x^2+2\sqrt{}\right.}{2b^2}$$

```
[In] Integrate[ArcSin[a + b*x],x]
```

```
[Out] x*ArcSin[a + b*x] + (2*b*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 2*a*b*ArcTan[(
Sqrt[-b^2]*x - Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/a] + a*Sqrt[-b^2]*Log[-1
+ 2*a*b*x + 2*b^2*x^2 + 2*Sqrt[-b^2]*x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]])/
(2*b^2)
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.89

method	result	size
derivativedivides	$\frac{(bx+a)\arcsin(bx+a)+\sqrt{1-(bx+a)^2}}{b}$	31
default	$\frac{(bx+a)\arcsin(bx+a)+\sqrt{1-(bx+a)^2}}{b}$	31
parts	$x\arcsin\left(bx+a\right)-b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{b\sqrt{b^2}}\right)$	88

```
[In] int(arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] 1/b*((b*x+a)*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.11

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin\left(bx+a\right)+\sqrt{-b^2x^2-2\,abx-a^2+1}}{b}$$

```
[In] integrate(arcsin(b*x+a),x, algorithm="fricas")
[Out] ((b*x + a)*arcsin(b*x + a) + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b
```

Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.31

$$\int \arcsin(a+bx)\,dx = \begin{cases} \frac{a\,\operatorname{asin}\left(a+bx\right)}{b}+x\,\operatorname{asin}\left(a+bx\right)+\frac{\sqrt{-a^2-2abx-b^2x^2+1}}{b} & \text{for } b\neq 0 \\ x\,\operatorname{asin}\left(a\right) & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(b*x+a),x)
[Out] Piecewise((a*asin(a + b*x)/b + x*asin(a + b*x) + sqrt(-a**2 - 2*a*b*x - b**
2*x**2 + 1)/b, Ne(b, 0)), (x*asin(a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.86

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin(bx+a)+\sqrt{-(bx+a)^2+1}}{b}$$

```
[In] integrate(arcsin(b*x+a),x, algorithm="maxima")
[Out] ((b*x + a)*arcsin(b*x + a) + sqrt(-(b*x + a)^2 + 1))/b
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.86

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin(bx+a)+\sqrt{-(bx+a)^2+1}}{b}$$

```
[In] integrate(arcsin(b*x+a),x, algorithm="giac")
[Out] ((b*x + a)*arcsin(b*x + a) + sqrt(-(b*x + a)^2 + 1))/b
```

Mupad [B] (verification not implemented)

Time = 0.57 (sec) , antiderivative size = 86, normalized size of antiderivative = 2.46

$$\int \arcsin(a+bx)\,dx = x\,\mathrm{asin}(a+b\,x)+\frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{b} + \frac{a\,\ln\left(\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}-\frac{x\,b^2+a\,b}{\sqrt{-b^2}}\right)}{\sqrt{-b^2}}$$

```
[In] int(asin(a + b*x),x)
[Out] x*asin(a + b*x) + (1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/b + (a*log((1 - b^2*x
^2 - 2*a*b*x - a^2)^(1/2) - (a*b + b^2*x)/(-b^2)^(1/2)))/(-b^2)^(1/2)
```

3.126 $\int \frac{\arcsin(a+bx)}{x}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 181

$$\int \frac{\arcsin(a+bx)}{x}\,dx = -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

```
[Out] -1/2*I*arcsin(b*x+a)^2+arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(
I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*
a+(-a^2+1)^(1/2)))-I*polylog(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1
)^(1/2)))-I*polylog(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4889, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{\arcsin(a+bx)}{x}\,dx = -i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right) + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right) - \frac{1}{2}i\arcsin(a+bx)^2$$

```
[In] Int[ArcSin[a + b*x]/x,x]
```

```
[Out] (-1/2*I)*ArcSin[a + b*x]^2 + ArcSin[a + b*x]*Log[1 - E^(I*ArcSin[a + b*x])/
(I*a - Sqrt[1 - a^2])] + ArcSin[a + b*x]*Log[1 - E^(I*ArcSin[a + b*x])/(I*a
 + Sqrt[1 - a^2])] - I*PolyLog[2, E^(I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2
])] - I*PolyLog[2, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{-\frac{a}{b}+\frac{x}{b}}\,dx, x, a+bx\right)}{b} \\
&= \frac{\text{Subst}\left(\int \frac{x\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{1}{2}i\arcsin(a+bx)^2 + \frac{i\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&\quad + \frac{i\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) \\
&\quad + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) \\
&\quad - \text{Subst}\left(\int \log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)\,dx, x, \arcsin(a+bx)\right) \\
&\quad - \text{Subst}\left(\int \log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)\,dx, x, \arcsin(a+bx)\right) \\
&= -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) \\
&\quad + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) \\
&\quad + i\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)}{x}\,dx, x, e^{i\arcsin(a+bx)}\right) \\
&\quad + i\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)}{x}\,dx, x, e^{i\arcsin(a+bx)}\right)
\end{aligned}
$$

$$= -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1 - \frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)\log\left(1 - \frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - i\,\text{PolyLog}\left(2, \frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - i\,\text{PolyLog}\left(2, \frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.09

$$\int \frac{\arcsin(a+bx)}{x}\,dx = -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1 + \frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b} - \frac{\sqrt{1-a^2}}{b}\right)b}\right) + \arcsin(a+bx)\log\left(1 + \frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b} + \frac{\sqrt{1-a^2}}{b}\right)b}\right) - i\,\text{PolyLog}\left(2, -\frac{e^{i\arcsin(a+bx)}}{-ia+\sqrt{1-a^2}}\right) - i\,\text{PolyLog}\left(2, \frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

```
[In] Integrate[ArcSin[a + b*x]/x,x]
[Out] (-1/2*I)*ArcSin[a + b*x]^2 + ArcSin[a + b*x]*Log[1 + E^(I*ArcSin[a + b*x])/
((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]*Log[1 + E^(I*ArcSin[a
 + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - I*PolyLog[2, -(E^(I*ArcSin[a
 + b*x])/((-I)*a + Sqrt[1 - a^2]))] - I*PolyLog[2, E^(I*ArcSin[a + b*x])/(I
*a + Sqrt[1 - a^2])]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 578 vs. 2(204) = 408.

Time = 0.80 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.20

method	result
derivativedivides	$-\frac{i\,\text{dilog}\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)a^2}{a^2-1} - \frac{i\arcsin(bx+a)^2}{2} - \frac{i\,\text{dilog}\left(\frac{ia-\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia-\sqrt{-a^2+1}}\right)a^2}{a^2-1}$
default	$-\frac{i\,\text{dilog}\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)a^2}{a^2-1} - \frac{i\arcsin(bx+a)^2}{2} - \frac{i\,\text{dilog}\left(\frac{ia-\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia-\sqrt{-a^2+1}}\right)a^2}{a^2-1}$

```
[In] int(arcsin(b*x+a)/x,x,method=_RETURNVERBOSE)
```

```
[Out] -I/(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(-
a^2+1)^(1/2)))*a^2-1/2*I*arcsin(b*x+a)^2-I/(a^2-1)*dilog((I*a-(-a^2+1)^(1/2
)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))*a^2+I/(a^2-1)*dilog(
(I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+I/
(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2
+1)^(1/2)))+arcsin(b*x+a)/(a^2-1)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+
a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))*a^2+arcsin(b*x+a)/(a^2-1)*ln((I*a-(-a^2+
1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))*a^2-arcsin(b*
x+a)/(a^2-1)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(-a
^2+1)^(1/2)))-arcsin(b*x+a)/(a^2-1)*ln((I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*
x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)/x,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)/x, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\operatorname{asin}\left(a+bx\right)}{x}\,dx$$

```
[In] integrate(asin(b*x+a)/x,x)
[Out] Integral(asin(a + b*x)/x, x)
```

Maxima [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)/x,x, algorithm="maxima")
[Out] integrate(arcsin(b*x + a)/x, x)
```

Giac [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)/x,x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x}\,dx$$

```
[In] int(asin(a + b*x)/x,x)
[Out] int(asin(a + b*x)/x, x)
```

3.127 $\int \frac{\arcsin(a+bx)}{x^2} dx$

Optimal result

Integrand size = 10, antiderivative size = 64

$$\int \frac{\arcsin(a+bx)}{x^2} dx = -\frac{\arcsin(a+bx)}{x} - \frac{b\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}$$

```
[Out] -arcsin(b*x+a)/x-b*arctanh((1-a*(b*x+a))/(-a^2+1)^(1/2)/(1-(b*x+a)^2)^(1/2)
)/(-a^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4889, 4827, 739, 212}

$$\int \frac{\arcsin(a+bx)}{x^2} dx = -\frac{b\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}} - \frac{\arcsin(a+bx)}{x}$$

```
[In] Int[ArcSin[a + b*x]/x^2,x]
```

```
[Out] -(ArcSin[a + b*x]/x) - (b*ArcTanh[(1 - a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 -
 (a + b*x)^2])])/Sqrt[1 - a^2]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\arcsin(a+bx)}{x} + \text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{\arcsin(a+bx)}{x} - \text{Subst}\left(\int \frac{1}{\frac{1}{b^2}-\frac{a^2}{b^2}-x^2}\,dx, x, \frac{\frac{1}{b}-\frac{a(a+bx)}{b}}{\sqrt{1-(a+bx)^2}}\right)\\
&= -\frac{\arcsin(a+bx)}{x} - \frac{b\operatorname{arctanh}\left(\frac{b\left(\frac{1}{b}-\frac{a(a+bx)}{b}\right)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.03

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = -\frac{\arcsin(a+bx)}{x} - \frac{b\operatorname{arctanh}\left(\frac{1-a^2-abx}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}$$

```
[In] Integrate[ArcSin[a + b*x]/x^2,x]
[Out] -(ArcSin[a + b*x]/x) - (b*ArcTanh[(1 - a^2 - a*b*x)/(Sqrt[1 - a^2]*Sqrt[1 -
 (a + b*x)^2])])/Sqrt[1 - a^2]
```

Maple [A] (verified)

Time = 0.39 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.17

method	result	size
parts	$-\frac{\arcsin(bx+a)}{x}-\frac{b\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{\sqrt{-a^2+1}}$	75
derivativedivides	$b\left(-\frac{\arcsin(bx+a)}{bx}-\frac{\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{\sqrt{-a^2+1}}\right)$	82
default	$b\left(-\frac{\arcsin(bx+a)}{bx}-\frac{\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{\sqrt{-a^2+1}}\right)$	82

```
[In] int(arcsin(b*x+a)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -arcsin(b*x+a)/x-b/(-a^2+1)^(1/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b
^2*x^2-2*a*b*x-a^2+1)^(1/2))/x)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 233, normalized size of antiderivative = 3.64

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \left[-\frac{\sqrt{-a^2+1}bx\log\left(\frac{(2\,a^2-1)b^2x^2+2\,a^4+4\,(a^3-a)bx+2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4\,a^2+2}{x^2}\right)+2\,(a^2-1)\,\mathrm{arcs}}{2\,(a^2-1)x}\right.$$

```
[In] integrate(arcsin(b*x+a)/x^2,x, algorithm="fricas")
```

```
[Out] [-1/2*(sqrt(-a^2 + 1)*b*x*log(((2*a^2 - 1)*b^2*x^2 + 2*a^4 + 4*(a^3 - a)*b*
x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt(-a^2 + 1) -
 4*a^2 + 2)/x^2) + 2*(a^2 - 1)*arcsin(b*x + a))/((a^2 - 1)*x), (sqrt(a^2 -
1)*b*x*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt(a^2
 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1)) - (a^2 - 1)*
arcsin(b*x + a))/((a^2 - 1)*x)]
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x^2}\,dx$$

```
[In] integrate(asin(b*x+a)/x**2,x)
```

```
[Out] Integral(asin(a + b*x)/x**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.23

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \frac{2\,b^2\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}|b|} - \frac{\arcsin(bx+a)}{x}$$

```
[In] integrate(arcsin(b*x+a)/x^2,x, algorithm="giac")
```

```
[Out] 2*b^2*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a/(b^2*x + a*
b) - 1)/sqrt(a^2 - 1))/(sqrt(a^2 - 1)*abs(b)) - arcsin(b*x + a)/x
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx=\int \frac{\mathrm{asin}(a+b\,x)}{x^2}\,dx$$

```
[In] int(asin(a + b*x)/x^2,x)
[Out] int(asin(a + b*x)/x^2, x)
```

3.128 $\int \frac{\arcsin(a+bx)}{x^3}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 103

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx=-\frac{b\sqrt{1-(a+bx)^2}}{2(1-a^2)\,x}-\frac{\arcsin(a+bx)}{2x^2}-\frac{ab^2\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{2(1-a^2)^{3/2}}$$

```
[Out] -1/2*arcsin(b*x+a)/x^2-1/2*a*b^2*arctanh((1-a*(b*x+a))/(-a^2+1)^(1/2)/(1-(b
*x+a)^2)^(1/2))/(-a^2+1)^(3/2)-1/2*b*(1-(b*x+a)^2)^(1/2)/(-a^2+1)/x
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4889, 4827, 745, 739, 212}

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx=-\frac{ab^2\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{2(1-a^2)^{3/2}}-\frac{b\sqrt{1-(a+bx)^2}}{2(1-a^2)\,x}-\frac{\arcsin(a+bx)}{2x^2}$$

```
[In] Int[ArcSin[a + b*x]/x^3,x]
```

```
[Out] -1/2*(b*Sqrt[1 - (a + b*x)^2])/((1 - a^2)*x) - ArcSin[a + b*x]/(2*x^2) - (a
*b^2*ArcTanh[(1 - a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/(2*(
1 - a^2)^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)^3}\,dx, x, a+bx\right)}{b} \\
&= -\frac{\arcsin(a+bx)}{2x^2}+\frac{1}{2}\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2\sqrt{1-x^2}}\,dx, x, a+bx\right) \\
&= -\frac{b\sqrt{1-(a+bx)^2}}{2\left(1-a^2\right)x}-\frac{\arcsin(a+bx)}{2x^2}+\frac{(ab)\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2\left(1-a^2\right)} \\
&= -\frac{b\sqrt{1-(a+bx)^2}}{2\left(1-a^2\right)x}-\frac{\arcsin(a+bx)}{2x^2}-\frac{(ab)\text{Subst}\left(\int \frac{1}{\frac{1}{b^2}-\frac{a^2}{b^2}-x^2}\,dx, x, \frac{\frac{1}{b}-\frac{a(a+bx)}{b}}{\sqrt{1-(a+bx)^2}}\right)}{2\left(1-a^2\right)} \\
&= -\frac{b\sqrt{1-(a+bx)^2}}{2\left(1-a^2\right)x}-\frac{\arcsin(a+bx)}{2x^2}-\frac{ab^2\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{2\left(1-a^2\right)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.21

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = -\frac{\arcsin(a+bx)+\frac{bx\left(\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}-abx\log(x)+abx\log\left(1-a^2-abx+\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}\right)\right)}{(1-a^2)^{3/2}}}{2x^2}$$

```
[In] Integrate[ArcSin[a + b*x]/x^3,x]
```

```
[Out] -1/2*(ArcSin[a + b*x] + (b*x*(Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^
2] - a*b*x*Log[x] + a*b*x*Log[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^2
- 2*a*b*x - b^2*x^2]]))/(1 - a^2)^(3/2))/x^2
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.13

method	result	size
parts	$-\frac{\arcsin(bx+a)}{2x^2}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)x}-\frac{ab\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{\left(-a^2+1\right)^{\frac{3}{2}}}\right)}{2}$	116
derivativedivides	$b^2\left(-\frac{\arcsin(bx+a)}{2b^2x^2}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{2(-a^2+1)^{\frac{3}{2}}}\right)$	124
default	$b^2\left(-\frac{\arcsin(bx+a)}{2b^2x^2}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{2(-a^2+1)^{\frac{3}{2}}}\right)$	124

```
[In] int(arcsin(b*x+a)/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*arcsin(b*x+a)/x^2+1/2*b*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)-
a*b/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*x-
a^2+1)^(1/2))/x))
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 325, normalized size of antiderivative = 3.16

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx$$
$$= \left[-\frac{\sqrt{-a^2+1}ab^2x^2\log\left(\frac{(2a^2-1)b^2x^2+2a^4+4(a^3-a)bx-2\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4a^2+2}{x^2}\right)-2\sqrt{-b^2x^2}}{4(a^4-2a^2+1)x^2}\right.$$
$$-\frac{\sqrt{a^2-1}ab^2x^2\arctan\left(\frac{\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{a^2-1}}{(a^2-1)b^2x^2+a^4+2(a^3-a)bx-2a^2+1}\right)-\sqrt{-b^2x^2-2abx-a^2+1}(a^2-1)bx+(a^4}{2(a^4-2a^2+1)x^2}$$

```
[In] integrate(arcsin(b*x+a)/x^3,x, algorithm="fricas")
```

```
[Out] [-1/4*(sqrt(-a^2 + 1)*a*b^2*x^2*log(((2*a^2 - 1)*b^2*x^2 + 2*a^4 + 4*(a^3 -
 a)*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt(-a^2
+ 1) - 4*a^2 + 2)/x^2) - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*b*x
 + 2*(a^4 - 2*a^2 + 1)*arcsin(b*x + a))/((a^4 - 2*a^2 + 1)*x^2), -1/2*(sqrt
(a^2 - 1)*a*b^2*x^2*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2
- 1)*sqrt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1))
 - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*b*x + (a^4 - 2*a^2 + 1)*arc
sin(b*x + a))/((a^4 - 2*a^2 + 1)*x^2)]
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x^3}\,dx$$

```
[In] integrate(asin(b*x+a)/x**3,x)
```

```
[Out] Integral(asin(a + b*x)/x**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 243 vs. $2(87) = 174$.

Time = 0.30 (sec) , antiderivative size = 243, normalized size of antiderivative = 2.36

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = -\left(\frac{ab^2\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{(a^2|b|-|b|)\sqrt{a^2-1}} - \frac{ab^2-\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)b^2}{b^2x+ab}}{(a^3|b|-a|b|)\left(\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)^2a}{(b^2x+ab)^2}+a-\frac{2\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)}{b^2x+ab}\right)}\right)b - \frac{\arcsin(bx+a)}{2\,x^2}$$

```
[In] integrate(arcsin(b*x+a)/x^3,x, algorithm="giac")
```

```
[Out] -(a*b^2*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a/(b^2*x +
a*b) - 1)/sqrt(a^2 - 1))/((a^2*abs(b) - abs(b))*sqrt(a^2 - 1)) - (a*b^2 - (
sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*b^2/(b^2*x + a*b))/((a^3*abs
(b) - a*abs(b))*((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a/(b^2*x
 + a*b)^2 + a - 2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)/(b^2*x +
a*b))))*b - 1/2*arcsin(b*x + a)/x^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x^3}\,dx$$

```
[In] int(asin(a + b*x)/x^3,x)
```

```
[Out] int(asin(a + b*x)/x^3, x)
```

3.129 $\int \frac{\arcsin(a+bx)}{x^4}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 144

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2x} - \frac{\arcsin(a+bx)}{3x^3} - \frac{(1+2a^2)\,b^3\text{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{6(1-a^2)^{5/2}}$$

```
[Out] -1/3*arcsin(b*x+a)/x^3-1/6*(2*a^2+1)*b^3*arctanh((1-a*(b*x+a))/(-a^2+1)^(1/
2)/(1-(b*x+a)^2)^(1/2))/(-a^2+1)^(5/2)-1/6*b*(1-(b*x+a)^2)^(1/2)/(-a^2+1)/x
^2-1/2*a*b^2*(1-(b*x+a)^2)^(1/2)/(-a^2+1)^2/x
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4889, 4827, 759, 821, 739, 212}

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = -\frac{(2a^2+1)\,b^3\text{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{6(1-a^2)^{5/2}} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2x} - \frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{\arcsin(a+bx)}{3x^3}$$

```
[In] Int[ArcSin[a + b*x]/x^4,x]
```

```
[Out] -1/6*(b*Sqrt[1 - (a + b*x)^2])/((1 - a^2)*x^2) - (a*b^2*Sqrt[1 - (a + b*x)^
2])/(2*(1 - a^2)^2*x) - ArcSin[a + b*x]/(3*x^3) - ((1 + 2*a^2)*b^3*ArcTanh[
```

```
(1 - a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/(6*(1 - a^2)^(5/2
))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 759

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)^4}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{\arcsin(a+bx)}{3x^3} + \frac{1}{3}\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)^3\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{\arcsin(a+bx)}{3x^3} + \frac{b^2\text{Subst}\left(\int \frac{\frac{2a}{b}+\frac{x}{b}}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2\sqrt{1-x^2}}\,dx, x, a+bx\right)}{6(1-a^2)}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2 x} - \frac{\arcsin(a+bx)}{3x^3} + \frac{\left((1+2a^2)b^2\right)\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)}{6(1-a^2)^2}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2 x} - \frac{\arcsin(a+bx)}{3x^3} - \frac{\left((1+2a^2)b^2\right)\text{Subst}\left(\int \frac{1}{\frac{1}{b^2}-\frac{a^2}{b^2}-x^2}\,dx, x, \frac{\frac{1}{b}-\frac{a(a+bx)}{b}}{\sqrt{1-(a+bx)^2}}\right)}{6(1-a^2)^2}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2 x} - \frac{\arcsin(a+bx)}{3x^3} - \frac{(1+2a^2)b^3\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{6(1-a^2)^{5/2}}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.15

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \frac{\sqrt{1-a^2}bx(-1+a^2-3abx)\sqrt{1-a^2-2abx-b^2x^2} - 2(1-a^2)^{5/2}\arcsin(a+bx) + (1+2a^2)b^3x^3\log(x)}{6(1-a^2)^{5/2}x^3}$$

```
[In] Integrate[ArcSin[a + b*x]/x^4,x]
[Out] (Sqrt[1 - a^2]*b*x*(-1 + a^2 - 3*a*b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] -
 2*(1 - a^2)^(5/2)*ArcSin[a + b*x] + (1 + 2*a^2)*b^3*x^3*Log[x] - (1 + 2*a^
2)*b^3*x^3*Log[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x - b^2
*x^2]])/(6*(1 - a^2)^(5/2)*x^3)
```

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.60

method	result
parts	$-\frac{\arcsin(bx+a)}{3x^3}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)x^2}+\frac{3ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)x}-\frac{ab\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx}}{x}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{2(-a^2+1)}\right.}{3}$
derivativedivides	$b^3\left(-\frac{\arcsin(bx+a)}{3b^3x^3}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{6(-a^2+1)b^2x^2}+\frac{a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2}}{bx}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{-2a^2+2}\right.$
default	$b^3\left(-\frac{\arcsin(bx+a)}{3b^3x^3}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{6(-a^2+1)b^2x^2}+\frac{a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2}}{bx}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{-2a^2+2}\right.$

```
[In] int(arcsin(b*x+a)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*arcsin(b*x+a)/x^3+1/3*b*(-1/2/(-a^2+1)/x^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1
/2)+3/2*a*b/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)-a*b/(-a^
2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2))/x))-1/2*b^2/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^
2*x^2-2*a*b*x-a^2+1)^(1/2))/x))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 404, normalized size of antiderivative = 2.81

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \left[-\frac{(2a^2+1)\sqrt{-a^2+1}b^3x^3\log\left(\frac{(2a^2-1)b^2x^2+2a^4+4(a^3-a)bx+2\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4a^2+2}{x^2}\right)+4(a}{12(a^6-3a^4+}\right.$$

```
[In] integrate(arcsin(b*x+a)/x^4,x, algorithm="fricas")
```

```
[Out] [-1/12*((2*a^2 + 1)*sqrt(-a^2 + 1)*b^3*x^3*log(((2*a^2 - 1)*b^2*x^2 + 2*a^4
 + 4*(a^3 - a)*b*x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)
*sqrt(-a^2 + 1) - 4*a^2 + 2)/x^2) + 4*(a^6 - 3*a^4 + 3*a^2 - 1)*arcsin(b*x
```

```
+ a) + 2*(3*(a^3 - a)*b^2*x^2 - (a^4 - 2*a^2 + 1)*b*x)*sqrt(-b^2*x^2 - 2*a*
b*x - a^2 + 1))/((a^6 - 3*a^4 + 3*a^2 - 1)*x^3), 1/6*((2*a^2 + 1)*sqrt(a^2
- 1)*b^3*x^3*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sq
rt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1)) - 2*(a
^6 - 3*a^4 + 3*a^2 - 1)*arcsin(b*x + a) - (3*(a^3 - a)*b^2*x^2 - (a^4 - 2*a
^2 + 1)*b*x)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/((a^6 - 3*a^4 + 3*a^2 - 1)
*x^3)]
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \int \frac{\operatorname{asin}\left(a+bx\right)}{x^4}\,dx$$

```
[In] integrate(asin(b*x+a)/x**4,x)
[Out] Integral(asin(a + b*x)/x**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)/x^4,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 557 vs. $2(122) = 244$.

Time = 0.30 (sec) , antiderivative size = 557, normalized size of antiderivative = 3.87

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \frac{1}{3}\,b\left(\frac{\left(2\,a^2b^3+b^3\right)\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{\left(a^4|b|-2\,a^2|b|+|b|\right)\sqrt{a^2-1}} - \frac{\frac{4\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)^2a^4b^3}{\left(b^2x+ab\right)^2}+4\,a^4b^3-\frac{11\left(\sqrt{-b^2x^2\cdots\right.}{\cdots}}{\cdots}\right. - \frac{\arcsin\left(bx+a\right)}{3\,x^3}$$

```
[In] integrate(arcsin(b*x+a)/x^4,x, algorithm="giac")
```

```
[Out] 1/3*b*((2*a^2*b^3 + b^3)*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b)
 + b)*a/(b^2*x + a*b) - 1)/sqrt(a^2 - 1))/((a^4*abs(b) - 2*a^2*abs(b) + abs
(b))*sqrt(a^2 - 1)) - (4*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*
a^4*b^3/(b^2*x + a*b)^2 + 4*a^4*b^3 - 11*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
)*abs(b) + b)*a^3*b^3/(b^2*x + a*b) - 5*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)
*abs(b) + b)^3*a^3*b^3/(b^2*x + a*b)^3 + 7*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 +
 1)*abs(b) + b)^2*a^2*b^3/(b^2*x + a*b)^2 - a^2*b^3 + 2*(sqrt(-b^2*x^2 - 2*
a*b*x - a^2 + 1)*abs(b) + b)*a*b^3/(b^2*x + a*b) + 2*(sqrt(-b^2*x^2 - 2*a*b
*x - a^2 + 1)*abs(b) + b)^3*a*b^3/(b^2*x + a*b)^3 - 2*(sqrt(-b^2*x^2 - 2*a*
b*x - a^2 + 1)*abs(b) + b)^2*b^3/(b^2*x + a*b)^2)/((a^6*abs(b) - 2*a^4*abs(
b) + a^2*abs(b))*((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a/(b^2*
x + a*b)^2 + a - 2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)/(b^2*x +
 a*b))^2)) - 1/3*arcsin(b*x + a)/x^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx=\int \frac{\mathrm{asin}(a+b\,x)}{x^4}\,dx$$

```
[In] int(asin(a + b*x)/x^4,x)
```

```
[Out] int(asin(a + b*x)/x^4, x)
```

3.130 $\int \frac{\arcsin(a+bx)}{x^5}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 186

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2}-\frac{(4+11a^2)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x}-\frac{\arcsin(a+bx)}{4x^4}-\frac{a(3+2a^2)b^4\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{8(1-a^2)^{7/2}}$$

```
[Out] -1/4*arcsin(b*x+a)/x^4-1/8*a*(2*a^2+3)*b^4*arctanh((1-a*(b*x+a))/(-a^2+1)^(
1/2)/(1-(b*x+a)^2)^(1/2))/(-a^2+1)^(7/2)-1/12*b*(1-(b*x+a)^2)^(1/2)/(-a^2+1
)/x^3-5/24*a*b^2*(1-(b*x+a)^2)^(1/2)/(-a^2+1)^2/x^2-1/24*(11*a^2+4)*b^3*(1-
(b*x+a)^2)^(1/2)/(-a^2+1)^3/x
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {4889, 4827, 759, 849, 821, 739, 212}

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = -\frac{a(2a^2+3)b^4\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{8(1-a^2)^{7/2}}-\frac{(11a^2+4)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x}-\frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2}-\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{\arcsin(a+bx)}{4x^4}$$

```
[In] Int[ArcSin[a + b*x]/x^5,x]
```

```
[Out] -1/12*(b*Sqrt[1 - (a + b*x)^2])/((1 - a^2)*x^3) - (5*a*b^2*Sqrt[1 - (a + b*
x)^2])/(24*(1 - a^2)^2*x^2) - ((4 + 11*a^2)*b^3*Sqrt[1 - (a + b*x)^2])/(24*
(1 - a^2)^3*x) - ArcSin[a + b*x]/(4*x^4) - (a*(3 + 2*a^2)*b^4*ArcTanh[(1 -
a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/(8*(1 - a^2)^(7/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 759

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2),
Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 849

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)^5}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\arcsin(a+bx)}{4x^4}+\frac{1}{4}\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)^4\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{\arcsin(a+bx)}{4x^4}+\frac{b^2\text{Subst}\left(\int \frac{\frac{3a}{b}+\frac{2x}{b}}{\left(-\frac{a}{b}+\frac{x}{b}\right)^3\sqrt{1-x^2}}\,dx, x, a+bx\right)}{12(1-a^2)}\\
&= -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2}-\frac{\arcsin(a+bx)}{4x^4}\\
&\quad -\frac{b^4\text{Subst}\left(\int \frac{-\frac{2(2+3a^2)}{b^2}-\frac{5ax}{b^2}}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2\sqrt{1-x^2}}\,dx, x, a+bx\right)}{24(1-a^2)^2}\\
&= -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2}-\frac{(4+11a^2)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x}\\
&\quad -\frac{\arcsin(a+bx)}{4x^4}+\frac{(a(3+2a^2)b^3)\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)}{8(1-a^2)^3}\\
&= -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3}-\frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2}-\frac{(4+11a^2)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x}\\
&\quad -\frac{\arcsin(a+bx)}{4x^4}-\frac{(a(3+2a^2)b^3)\text{Subst}\left(\int \frac{1}{\frac{1}{b^2}-\frac{a^2}{b^2}-x^2}\,dx, x, \frac{\frac{1}{b}-\frac{a(a+bx)}{b}}{\sqrt{1-(a+bx)^2}}\right)}{8(1-a^2)^3}
\end{aligned}
$$

$$= -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3} - \frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2} - \frac{(4+11a^2)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x} - \frac{\arcsin(a+bx)}{4x^4} - \frac{a(3+2a^2)b^4\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{8(1-a^2)^{7/2}}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.04

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \frac{1}{8}\left(\frac{b\sqrt{1-a^2-2abx-b^2x^2}(2+2a^4+5abx-5a^3bx+4b^2x^2+a^2(-4+11b^2x^2))}{3(-1+a^2)^3x^3} - \frac{2\arcsin(a+bx)}{x^4} + \frac{a(3+2a^2)b^4\log(x)}{(1-a^2)^{7/2}} - \frac{a(3+2a^2)b^4\log\left(1-a^2-abx+\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}\right)}{(1-a^2)^{7/2}}\right)$$

```
[In] Integrate[ArcSin[a + b*x]/x^5,x]
```

```
[Out] ((b*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(2 + 2*a^4 + 5*a*b*x - 5*a^3*b*x + 4*
b^2*x^2 + a^2*(-4 + 11*b^2*x^2)))/(3*(-1 + a^2)^3*x^3) - (2*ArcSin[a + b*x]
)/x^4 + (a*(3 + 2*a^2)*b^4*Log[x])/(1 - a^2)^(7/2) - (a*(3 + 2*a^2)*b^4*Log
[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]])/(1 - a
^2)^(7/2))/8
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 393 vs. $2(164) = 328$.

Time $= 0.33$ (sec) , antiderivative size $= 394$, normalized size of antiderivative $= 2.12$

method	result
parts	$-\frac{\arcsin(bx+a)}{4x^4}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{3\left(-a^2+1\right)x^3}+\frac{5ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)x^2}+\frac{3ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)x}-\frac{ab\ln\left(\frac{-2a^2+2\cdots}{\cdots}\right)}{\cdots}\right)}{2\left(-a\cdots\right)}\right)}{\cdots}\right)}{\cdots}$
derivativedivides	$b^4\left(-\frac{\arcsin(bx+a)}{4b^4x^4}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{12(-a^2+1)b^3x^3}+\frac{5a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)b^2x^2}+\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)bx}-\frac{a\ln\left(\frac{-2a\cdots}{\cdots}\right)}{\cdots}\right)}{2\cdots}\right)}{\cdots}\right)$
default	$b^4\left(-\frac{\arcsin(bx+a)}{4b^4x^4}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{12(-a^2+1)b^3x^3}+\frac{5a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)b^2x^2}+\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)bx}-\frac{a\ln\left(\frac{-2a\cdots}{\cdots}\right)}{\cdots}\right)}{2\cdots}\right)}{\cdots}\right)$

```
[In] int(arcsin(b*x+a)/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*arcsin(b*x+a)/x^4+1/4*b*(-1/3/(-a^2+1)/x^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1
/2)+5/3*a*b/(-a^2+1)*(-1/2/(-a^2+1)/x^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+3/2*
a*b/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)-a*b/(-a^2+1)^(3/
2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2))/x)
)-1/2*b^2/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*
a*b*x-a^2+1)^(1/2))/x))+2/3*b^2/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a
^2+1)^(1/2)-a*b/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*
x^2-2*a*b*x-a^2+1)^(1/2))/x)))
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 484, normalized size of antiderivative = 2.60

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx$$
$$= \left[-\frac{3\,(2\,a^3+3\,a)\sqrt{-a^2+1}b^4x^4\log\left(\frac{(2\,a^2-1)b^2x^2+2\,a^4+4\,(a^3-a)bx-2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4\,a^2+2}{x^2}\right)+}{}\right.$$
$$-\frac{3\,(2\,a^3+3\,a)\sqrt{a^2-1}b^4x^4\arctan\left(\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{a^2-1}}{(a^2-1)b^2x^2+a^4+2\,(a^3-a)bx-2\,a^2+1}\right)+6\,(a^8-4\,a^6+6\,a^4-4\,a^2+1)\,\mathrm{arc}}{24\,(a^8-4\,}$$

```
[In] integrate(arcsin(b*x+a)/x^5,x, algorithm="fricas")
```

```
[Out] [-1/48*(3*(2*a^3 + 3*a)*sqrt(-a^2 + 1)*b^4*x^4*log(((2*a^2 - 1)*b^2*x^2 + 2
*a^4 + 4*(a^3 - a)*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2
- 1)*sqrt(-a^2 + 1) - 4*a^2 + 2)/x^2) + 12*(a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1
)*arcsin(b*x + a) - 2*((11*a^4 - 7*a^2 - 4)*b^3*x^3 - 5*(a^5 - 2*a^3 + a)*b
^2*x^2 + 2*(a^6 - 3*a^4 + 3*a^2 - 1)*b*x)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
))/((a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1)*x^4), -1/24*(3*(2*a^3 + 3*a)*sqrt(a^2
 - 1)*b^4*x^4*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*s
qrt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1)) + 6*(
a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1)*arcsin(b*x + a) - ((11*a^4 - 7*a^2 - 4)*b^
3*x^3 - 5*(a^5 - 2*a^3 + a)*b^2*x^2 + 2*(a^6 - 3*a^4 + 3*a^2 - 1)*b*x)*sqrt
(-b^2*x^2 - 2*a*b*x - a^2 + 1))/((a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1)*x^4)]
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \int \frac{\operatorname{asin}\left(a+bx\right)}{x^5}\,dx$$

```
[In] integrate(asin(b*x+a)/x**5,x)
```

```
[Out] Integral(asin(a + b*x)/x**5, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^5} dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1112 vs. $2(158) = 316$.

Time = 0.37 (sec) , antiderivative size = 1112, normalized size of antiderivative = 5.98

$$\int \frac{\arcsin(a+bx)}{x^5} dx = \text{Too large to display}$$

```
[In] integrate(arcsin(b*x+a)/x^5,x, algorithm="giac")
```

```
[Out] -1/12*b*(3*(2*a^3*b^4 + 3*a*b^4)*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
)*abs(b) + b)*a/(b^2*x + a*b) - 1)/sqrt(a^2 - 1))/((a^6*abs(b) - 3*a^4*abs(
b) + 3*a^2*abs(b) - abs(b))*sqrt(a^2 - 1)) - (36*(sqrt(-b^2*x^2 - 2*a*b*x -
 a^2 + 1)*abs(b) + b)^2*a^7*b^4/(b^2*x + a*b)^2 + 18*(sqrt(-b^2*x^2 - 2*a*b
*x - a^2 + 1)*abs(b) + b)^4*a^7*b^4/(b^2*x + a*b)^4 + 18*a^7*b^4 - 81*(sqrt
(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a^6*b^4/(b^2*x + a*b) - 108*(sqr
t(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*a^6*b^4/(b^2*x + a*b)^3 - 27*
(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^5*a^6*b^4/(b^2*x + a*b)^5 +
 120*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a^5*b^4/(b^2*x + a*b
)^2 + 81*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^4*a^5*b^4/(b^2*x +
 a*b)^4 - 5*a^5*b^4 + 12*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a^
4*b^4/(b^2*x + a*b) - 42*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*
a^4*b^4/(b^2*x + a*b)^3 + 18*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b
)^5*a^4*b^4/(b^2*x + a*b)^5 - 18*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b)
 + b)^2*a^3*b^4/(b^2*x + a*b)^2 - 36*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*ab
s(b) + b)^4*a^3*b^4/(b^2*x + a*b)^4 + 2*a^3*b^4 - 6*(sqrt(-b^2*x^2 - 2*a*b*
x - a^2 + 1)*abs(b) + b)*a^2*b^4/(b^2*x + a*b) + 8*(sqrt(-b^2*x^2 - 2*a*b*x
 - a^2 + 1)*abs(b) + b)^3*a^2*b^4/(b^2*x + a*b)^3 - 6*(sqrt(-b^2*x^2 - 2*a*
b*x - a^2 + 1)*abs(b) + b)^5*a^2*b^4/(b^2*x + a*b)^5 + 12*(sqrt(-b^2*x^2 -
2*a*b*x - a^2 + 1)*abs(b) + b)^2*a*b^4/(b^2*x + a*b)^2 + 12*(sqrt(-b^2*x^2
- 2*a*b*x - a^2 + 1)*abs(b) + b)^4*a*b^4/(b^2*x + a*b)^4 - 8*(sqrt(-b^2*x^2
```

```
 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*b^4/(b^2*x + a*b)^3)/((a^9*abs(b) - 3*a
^7*abs(b) + 3*a^5*abs(b) - a^3*abs(b))*((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)
*abs(b) + b)^2*a/(b^2*x + a*b)^2 + a - 2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
)*abs(b) + b)/(b^2*x + a*b))^3)) - 1/4*arcsin(b*x + a)/x^4
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx=\int \frac{\mathrm{asin}(a+b\,x)}{x^5}\,dx$$

```
[In] int(asin(a + b*x)/x^5,x)
```

```
[Out] int(asin(a + b*x)/x^5, x)
```

3.131 $\int x^3 \arcsin(a+bx)^2 \, dx$

Optimal result

Integrand size = 12, antiderivative size = 343

$$\begin{aligned}\int x^3 \arcsin(a+bx)^2 \, dx = {} & \frac{4ax}{3b^3} + \frac{2a^3x}{b^3} - \frac{3(a+bx)^2}{32b^4} - \frac{3a^2(a+bx)^2}{4b^4} + \frac{2a(a+bx)^3}{9b^4} \\ & - \frac{(a+bx)^4}{32b^4} - \frac{4a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} \\ & - \frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} \\ & + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{16b^4} \\ & + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} \\ & - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} \\ & + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} - \frac{3\arcsin(a+bx)^2}{32b^4} \\ & - \frac{3a^2\arcsin(a+bx)^2}{4b^4} - \frac{a^4\arcsin(a+bx)^2}{4b^4} + \frac{1}{4}x^4\arcsin(a+bx)^2\end{aligned}$$

```
[Out] 4/3*a*x/b^3+2*a^3*x/b^3-3/32*(b*x+a)^2/b^4-3/4*a^2*(b*x+a)^2/b^4+2/9*a*(b*x
+a)^3/b^4-1/32*(b*x+a)^4/b^4-3/32*arcsin(b*x+a)^2/b^4-3/4*a^2*arcsin(b*x+a)
^2/b^4-1/4*a^4*arcsin(b*x+a)^2/b^4+1/4*x^4*arcsin(b*x+a)^2-4/3*a*arcsin(b*x
+a)*(1-(b*x+a)^2)^(1/2)/b^4-2*a^3*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4+3/1
6*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4+3/2*a^2*(b*x+a)*arcsin(b*x+
a)*(1-(b*x+a)^2)^(1/2)/b^4-2/3*a*(b*x+a)^2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2
)/b^4+1/8*(b*x+a)^3*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4889, 4827, 4847, 4737, 4767, 8, 4795, 30}

$$\int x^3 \arcsin(a+bx)^2\,dx = -\frac{a^4 \arcsin(a+bx)^2}{4b^4} - \frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} + \frac{2a^3x}{b^3} - \frac{3a^2\arcsin(a+bx)^2}{4b^4} + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} - \frac{3a^2(a+bx)^2}{4b^4} - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} - \frac{4a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} - \frac{3\arcsin(a+bx)^2}{32b^4} + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{16b^4} + \frac{1}{4}x^4\arcsin(a+bx)^2 + \frac{2a(a+bx)^3}{9b^4} - \frac{(a+bx)^4}{32b^4} - \frac{3(a+bx)^2}{32b^4} + \frac{4ax}{3b^3}$$

```
[In] Int[x^3*ArcSin[a + b*x]^2,x]
```

```
[Out] (4*a*x)/(3*b^3) + (2*a^3*x)/b^3 - (3*(a + b*x)^2)/(32*b^4) - (3*a^2*(a + b*
x)^2)/(4*b^4) + (2*a*(a + b*x)^3)/(9*b^4) - (a + b*x)^4/(32*b^4) - (4*a*Sqr
t[1 - (a + b*x)^2]*ArcSin[a + b*x])/(3*b^4) - (2*a^3*Sqrt[1 - (a + b*x)^2]*
ArcSin[a + b*x])/b^4 + (3*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/
(16*b^4) + (3*a^2*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(2*b^4)
- (2*a*(a + b*x)^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(3*b^4) + ((a + b
*x)^3*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(8*b^4) - (3*ArcSin[a + b*x]^2
)/(32*b^4) - (3*a^2*ArcSin[a + b*x]^2)/(4*b^4) - (a^4*ArcSin[a + b*x]^2)/(4
*b^4) + (x^4*ArcSin[a + b*x]^2)/4
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^3 \arcsin(x)^2\,dx, x, a+bx\right)}{b} \\
&= \frac{1}{4}x^4\arcsin(a+bx)^2 - \frac{1}{2}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^4 \arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right) \\
&= \frac{1}{4}x^4\arcsin(a+bx)^2 - \frac{1}{2}\text{Subst}\left(\int \left(\frac{a^4\arcsin(x)}{b^4\sqrt{1-x^2}} - \frac{4a^3x\arcsin(x)}{b^4\sqrt{1-x^2}} \right.\right. \\
&\quad \left.\left. + \frac{6a^2x^2\arcsin(x)}{b^4\sqrt{1-x^2}} - \frac{4ax^3\arcsin(x)}{b^4\sqrt{1-x^2}} + \frac{x^4\arcsin(x)}{b^4\sqrt{1-x^2}}\right)dx, x, a+bx\right) \\
&= \frac{1}{4}x^4\arcsin(a+bx)^2 - \frac{\text{Subst}\left(\int \frac{x^4\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b^4} \\
&\quad + \frac{(2a)\text{Subst}\left(\int \frac{x^3\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b^4} - \frac{(3a^2)\,\text{Subst}\left(\int \frac{x^2\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b^4} \\
&\quad + \frac{(2a^3)\,\text{Subst}\left(\int \frac{x\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b^4} - \frac{a^4\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b^4} \\
&= -\frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} \\
&\quad - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} \\
&\quad + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} - \frac{a^4\arcsin(a+bx)^2}{4b^4} \\
&\quad + \frac{1}{4}x^4\arcsin(a+bx)^2 - \frac{\text{Subst}\left(\int x^3\,dx, x, a+bx\right)}{8b^4} \\
&\quad - \frac{3\text{Subst}\left(\int \frac{x^2\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{8b^4} + \frac{(2a)\text{Subst}\left(\int x^2\,dx, x, a+bx\right)}{3b^4} \\
&\quad + \frac{(4a)\text{Subst}\left(\int \frac{x\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{3b^4} - \frac{(3a^2)\,\text{Subst}\left(\int x\,dx, x, a+bx\right)}{2b^4} \\
&\quad - \frac{(3a^2)\,\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b^4} + \frac{(2a^3)\,\text{Subst}\left(\int 1\,dx, x, a+bx\right)}{b^4}
\end{aligned}
$$

$$= \frac{2a^3x}{b^3} - \frac{3a^2(a+bx)^2}{4b^4} + \frac{2a(a+bx)^3}{9b^4} - \frac{(a+bx)^4}{32b^4} - \frac{4a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} - \frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{16b^4} + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} - \frac{3a^2\arcsin(a+bx)^2}{4b^4} - \frac{a^4\arcsin(a+bx)^2}{4b^4} + \frac{1}{4}x^4\arcsin(a+bx)^2 - \frac{3\text{Subst}(\int x\,dx, x, a+bx)}{16b^4} - \frac{3\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{16b^4} + \frac{(4a)\text{Subst}(\int 1\,dx, x, a+bx)}{3b^4}$$

$$= \frac{4ax}{3b^3} + \frac{2a^3x}{b^3} - \frac{3(a+bx)^2}{32b^4} - \frac{3a^2(a+bx)^2}{4b^4} + \frac{2a(a+bx)^3}{9b^4} - \frac{(a+bx)^4}{32b^4} - \frac{4a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} - \frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{16b^4} + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} - \frac{3\arcsin(a+bx)^2}{32b^4} - \frac{3a^2\arcsin(a+bx)^2}{4b^4} - \frac{a^4\arcsin(a+bx)^2}{4b^4} + \frac{1}{4}x^4\arcsin(a+bx)^2$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.43

$$\int x^3\arcsin(a+bx)^2\,dx$$

$$= \frac{bx(300a^3 - 78a^2bx - 9bx(3+b^2x^2) + a(330+28b^2x^2)) - 6\sqrt{1-a^2-2abx-b^2x^2}(55a+50a^3-9bx-2}{288b^4}$$

```
[In] Integrate[x^3*ArcSin[a + b*x]^2,x]
```

```
[Out] (b*x*(300*a^3 - 78*a^2*b*x - 9*b*x*(3 + b^2*x^2) + a*(330 + 28*b^2*x^2)) -
6*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(55*a + 50*a^3 - 9*b*x - 26*a^2*b*x + 1
4*a*b^2*x^2 - 6*b^3*x^3)*ArcSin[a + b*x] - 9*(3 + 24*a^2 + 8*a^4 - 8*b^4*x^
4)*ArcSin[a + b*x]^2)/(288*b^4)
```

Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 309, normalized size of antiderivative = 0.90

method	result
derivativedivides	$\frac{\frac{\arcsin(bx+a)^2(bx+a)^4}{4}-\frac{\arcsin(bx+a)\left(-2(bx+a)^3\sqrt{1-(bx+a)^2}-3(bx+a)\sqrt{1-(bx+a)^2}+3\arcsin(bx+a)\right)}{16}+\frac{3\arcsin(bx+a)^2}{32}-\frac{(2(bx+}{1}}{}$
default	$\frac{\frac{\arcsin(bx+a)^2(bx+a)^4}{4}-\frac{\arcsin(bx+a)\left(-2(bx+a)^3\sqrt{1-(bx+a)^2}-3(bx+a)\sqrt{1-(bx+a)^2}+3\arcsin(bx+a)\right)}{16}+\frac{3\arcsin(bx+a)^2}{32}-\frac{(2(bx+}{1}}{}$

```
[In] int(x^3*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^4*(1/4*arcsin(b*x+a)^2*(b*x+a)^4-1/16*arcsin(b*x+a)*(-2*(b*x+a)^3*(1-(b
*x+a)^2)^(1/2)-3*(b*x+a)*(1-(b*x+a)^2)^(1/2)+3*arcsin(b*x+a))+3/32*arcsin(b
*x+a)^2-1/128*(2*(b*x+a)^2+3)^2-1/9*a*(9*(b*x+a)^3*arcsin(b*x+a)^2+6*arcsin
(b*x+a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)^2-2*(b*x+a)^3+12*arcsin(b*x+a)*(1-(b*x+
a)^2)^(1/2)-12*b*x-12*a)+3/4*a^2*(2*arcsin(b*x+a)^2*(b*x+a)^2+2*arcsin(b*x+
a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)-arcsin(b*x+a)^2-(b*x+a)^2)-a^3*(arcsin(b*x+a
)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.43

$$\int x^3 \arcsin(a+bx)^2\,dx =$$
$$-\frac{9\,b^4x^4-28\,ab^3x^3+3\,(26\,a^2+9)b^2x^2-30\,(10\,a^3+11\,a)bx-9\,(8\,b^4x^4-8\,a^4-24\,a^2-3)\arcsin\left(bx+a\right)}{288\,b^4}$$

```
[In] integrate(x^3*arcsin(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/288*(9*b^4*x^4 - 28*a*b^3*x^3 + 3*(26*a^2 + 9)*b^2*x^2 - 30*(10*a^3 + 11
*a)*b*x - 9*(8*b^4*x^4 - 8*a^4 - 24*a^2 - 3)*arcsin(b*x + a)^2 - 6*(6*b^3*x
^3 - 14*a*b^2*x^2 - 50*a^3 + (26*a^2 + 9)*b*x - 55*a)*sqrt(-b^2*x^2 - 2*a*b
*x - a^2 + 1)*arcsin(b*x + a))/b^4
```

Sympy [A] (verification not implemented)

Time = 0.46 (sec) , antiderivative size = 366, normalized size of antiderivative = 1.07

$$\int x^3 \arcsin(a+bx)^2\,dx$$
$$= \begin{cases} -\frac{a^4 \operatorname{asin}^2(a+bx)}{4b^4} + \frac{25a^3x}{24b^3} - \frac{25a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{24b^4} - \frac{13a^2x^2}{48b^2} + \frac{13a^2x\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{24b^3} - \frac{3a^2 \operatorname{asi}}{4} \\ \frac{x^4 \operatorname{asin}^2(a)}{4} \end{cases}$$

```
[In] integrate(x**3*asin(b*x+a)**2,x)
```

```
[Out] Piecewise((-a**4*asin(a + b*x)**2/(4*b**4) + 25*a**3*x/(24*b**3) - 25*a**3*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(24*b**4) - 13*a**2*x**
2/(48*b**2) + 13*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)
/(24*b**3) - 3*a**2*asin(a + b*x)**2/(4*b**4) + 7*a*x**3/(72*b) - 7*a*x**2*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(24*b**2) + 55*a*x/(48*
b**3) - 55*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(48*b**4)
+ x**4*asin(a + b*x)**2/4 - x**4/32 + x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2
 + 1)*asin(a + b*x)/(8*b) - 3*x**2/(32*b**2) + 3*x*sqrt(-a**2 - 2*a*b*x - b
**2*x**2 + 1)*asin(a + b*x)/(16*b**3) - 3*asin(a + b*x)**2/(32*b**4), Ne(b,
 0)), (x**4*asin(a)**2/4, True))
```

Maxima [F]

$$\int x^3 \arcsin(a+bx)^2\,dx = \int x^3 \arcsin(bx+a)^2\,dx$$

```
[In] integrate(x^3*arcsin(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + b*integr
ate(1/2*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^4*arctan2(b*x + a, sqrt(b*x
+ a + 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.28

$$\int x^3 \arcsin(a+bx)^2\,dx = -\frac{(bx+a)a^3 \arcsin(bx+a)^2}{b^4} - \frac{\left((bx+a)^2-1\right)(bx+a)a \arcsin(bx+a)^2}{b^4} + \frac{3\left((bx+a)^2-1\right)a^2 \arcsin(bx+a)^2}{2\,b^4} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a^2 \arcsin(bx+a)}{2\,b^4} - \frac{2\sqrt{-(bx+a)^2+1}a^3 \arcsin(bx+a)}{b^4} + \frac{2\,(bx+a)a^3}{b^4} + \frac{\left((bx+a)^2-1\right)^2 \arcsin(bx+a)^2}{4\,b^4} - \frac{(bx+a)a \arcsin(bx+a)^2}{b^4} + \frac{3\,a^2 \arcsin(bx+a)^2}{4\,b^4} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a) \arcsin(bx+a)}{8\,b^4} + \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}} a \arcsin(bx+a)}{3\,b^4} + \frac{2\left((bx+a)^2-1\right)(bx+a)a}{9\,b^4} - \frac{3\left((bx+a)^2-1\right)a^2}{4\,b^4} + \frac{\left((bx+a)^2-1\right) \arcsin(bx+a)^2}{2\,b^4} + \frac{5\sqrt{-(bx+a)^2+1}(bx+a) \arcsin(bx+a)}{16\,b^4} - \frac{2\sqrt{-(bx+a)^2+1}a \arcsin(bx+a)}{b^4} - \frac{\left((bx+a)^2-1\right)^2}{32\,b^4} + \frac{14\,(bx+a)a}{9\,b^4} - \frac{3\,a^2}{8\,b^4} + \frac{5\,\arcsin(bx+a)^2}{32\,b^4} - \frac{5\left((bx+a)^2-1\right)}{32\,b^4} - \frac{17}{256\,b^4}$$

```
[In] integrate(x^3*arcsin(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -(b*x + a)*a^3*arcsin(b*x + a)^2/b^4 - ((b*x + a)^2 - 1)*(b*x + a)*a*arcsin
(b*x + a)^2/b^4 + 3/2*((b*x + a)^2 - 1)*a^2*arcsin(b*x + a)^2/b^4 + 3/2*sqr
t(-(b*x + a)^2 + 1)*(b*x + a)*a^2*arcsin(b*x + a)/b^4 - 2*sqrt(-(b*x + a)^2
 + 1)*a^3*arcsin(b*x + a)/b^4 + 2*(b*x + a)*a^3/b^4 + 1/4*((b*x + a)^2 - 1)
^2*arcsin(b*x + a)^2/b^4 - (b*x + a)*a*arcsin(b*x + a)^2/b^4 + 3/4*a^2*arcs
```

```
in(b*x + a)^2/b^4 - 1/8*(-(b*x + a)^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)/
b^4 + 2/3*(-(b*x + a)^2 + 1)^(3/2)*a*arcsin(b*x + a)/b^4 + 2/9*((b*x + a)^2
 - 1)*(b*x + a)*a/b^4 - 3/4*((b*x + a)^2 - 1)*a^2/b^4 + 1/2*((b*x + a)^2 -
1)*arcsin(b*x + a)^2/b^4 + 5/16*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*arcsin(b*x
 + a)/b^4 - 2*sqrt(-(b*x + a)^2 + 1)*a*arcsin(b*x + a)/b^4 - 1/32*((b*x + a
)^2 - 1)^2/b^4 + 14/9*(b*x + a)*a/b^4 - 3/8*a^2/b^4 + 5/32*arcsin(b*x + a)^
2/b^4 - 5/32*((b*x + a)^2 - 1)/b^4 - 17/256/b^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \arcsin(a+bx)^2\,dx = \int x^3\,\mathrm{asin}(a+b\,x)^2\,dx$$

```
[In] int(x^3*asin(a + b*x)^2,x)
```

```
[Out] int(x^3*asin(a + b*x)^2, x)
```

3.132 $\int x^2 \arcsin(a+bx)^2\,dx$

Optimal result

Integrand size = 12, antiderivative size = 220

$$\int x^2 \arcsin(a+bx)^2\,dx = -\frac{4x}{9b^2}-\frac{2a^2x}{b^2}+\frac{a(a+bx)^2}{2b^3}-\frac{2(a+bx)^3}{27b^3}+\frac{4\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3}+\frac{2a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3}-\frac{a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3}+\frac{2(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3}+\frac{a\arcsin(a+bx)^2}{2b^3}+\frac{a^3\arcsin(a+bx)^2}{3b^3}+\frac{1}{3}x^3\arcsin(a+bx)^2$$

```
[Out] -4/9*x/b^2-2*a^2*x/b^2+1/2*a*(b*x+a)^2/b^3-2/27*(b*x+a)^3/b^3+1/2*a*arcsin(
b*x+a)^2/b^3+1/3*a^3*arcsin(b*x+a)^2/b^3+1/3*x^3*arcsin(b*x+a)^2+4/9*arcsin
(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2*a^2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3
-a*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2/9*(b*x+a)^2*arcsin(b*x+a
)*(1-(b*x+a)^2)^(1/2)/b^3
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4889, 4827, 4847, 4737, 4767, 8, 4795, 30}

$$\int x^2 \arcsin(a+bx)^2\,dx = \frac{a^3\arcsin(a+bx)^2}{3b^3}+\frac{2a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3}-\frac{2a^2x}{b^2}+\frac{a\arcsin(a+bx)^2}{2b^3}-\frac{a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3}+\frac{2(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3}+\frac{4\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3}+\frac{1}{3}x^3\arcsin(a+bx)^2+\frac{a(a+bx)^2}{2b^3}-\frac{2(a+bx)^3}{27b^3}-\frac{4x}{9b^2}$$

```
[In] Int[x^2*ArcSin[a + b*x]^2,x]
```

```
[Out] (-4*x)/(9*b^2) - (2*a^2*x)/b^2 + (a*(a + b*x)^2)/(2*b^3) - (2*(a + b*x)^3)/
(27*b^3) + (4*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(9*b^3) + (2*a^2*Sqrt[
1 - (a + b*x)^2]*ArcSin[a + b*x])/b^3 - (a*(a + b*x)*Sqrt[1 - (a + b*x)^2]*
ArcSin[a + b*x])/b^3 + (2*(a + b*x)^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]
)/(9*b^3) + (a*ArcSin[a + b*x]^2)/(2*b^3) + (a^3*ArcSin[a + b*x]^2)/(3*b^3)
 + (x^3*ArcSin[a + b*x]^2)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^2 \arcsin(x)^2\,dx, x, a+bx\right)}{b}$$

$$= \frac{1}{3}x^3\arcsin(a+bx)^2 - \frac{2}{3}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^3 \arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= \frac{1}{3}x^3 \arcsin(a+bx)^2 - \frac{2}{3}\text{Subst}\left(\int \left(-\frac{a^3 \arcsin(x)}{b^3\sqrt{1-x^2}} + \frac{3a^2 x \arcsin(x)}{b^3\sqrt{1-x^2}} - \frac{3ax^2 \arcsin(x)}{b^3\sqrt{1-x^2}} + \frac{x^3 \arcsin(x)}{b^3\sqrt{1-x^2}}\right) dx, x, a+bx\right)$$

$$= \frac{1}{3}x^3 \arcsin(a+bx)^2 - \frac{2\text{Subst}\left(\int \frac{x^3 \arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{3b^3} + \frac{(2a)\text{Subst}\left(\int \frac{x^2 \arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{b^3} - \frac{(2a^2)\,\text{Subst}\left(\int \frac{x \arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{b^3} + \frac{(2a^3)\,\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{3b^3}$$

$$= \frac{2a^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} - \frac{a(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} + \frac{2(a+bx)^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{9b^3} + \frac{a^3 \arcsin(a+bx)^2}{3b^3} + \frac{1}{3}x^3 \arcsin(a+bx)^2 - \frac{2\text{Subst}\left(\int x^2\, dx, x, a+bx\right)}{9b^3} - \frac{4\text{Subst}\left(\int \frac{x \arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{9b^3} + \frac{a\text{Subst}\left(\int x\, dx, x, a+bx\right)}{b^3} + \frac{a\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}} dx, x, a+bx\right)}{b^3} - \frac{(2a^2)\,\text{Subst}\left(\int 1\, dx, x, a+bx\right)}{b^3}$$

$$= -\frac{2a^2 x}{b^2} + \frac{a(a+bx)^2}{2b^3} - \frac{2(a+bx)^3}{27b^3} + \frac{4\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{9b^3} + \frac{2a^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} - \frac{a(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} + \frac{2(a+bx)^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{9b^3} + \frac{a \arcsin(a+bx)^2}{2b^3} + \frac{a^3 \arcsin(a+bx)^2}{3b^3} + \frac{1}{3}x^3 \arcsin(a+bx)^2 - \frac{4\text{Subst}\left(\int 1\, dx, x, a+bx\right)}{9b^3}$$

$$= -\frac{4x}{9b^2} - \frac{2a^2 x}{b^2} + \frac{a(a+bx)^2}{2b^3} - \frac{2(a+bx)^3}{27b^3} + \frac{4\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{9b^3} + \frac{2a^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} - \frac{a(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{b^3} + \frac{2(a+bx)^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)}{9b^3} + \frac{a \arcsin(a+bx)^2}{2b^3} + \frac{a^3 \arcsin(a+bx)^2}{3b^3} + \frac{1}{3}x^3 \arcsin(a+bx)^2$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.50

$$\int x^2 \arcsin(a+bx)^2 \, dx$$
$$= \frac{-bx(24+66a^2-15abx+4b^2x^2)+6\sqrt{1-a^2-2abx-b^2x^2}(4+11a^2-5abx+2b^2x^2)\arcsin(a+bx)+9(}{54b^3}$$

```
[In] Integrate[x^2*ArcSin[a + b*x]^2,x]
```

```
[Out] (-(b*x*(24 + 66*a^2 - 15*a*b*x + 4*b^2*x^2)) + 6*Sqrt[1 - a^2 - 2*a*b*x - b
^2*x^2]*(4 + 11*a^2 - 5*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x] + 9*(3*a + 2*a^3
 + 2*b^3*x^3)*ArcSin[a + b*x]^2)/(54*b^3)
```

Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.83

method	result
derivativedivides	$\frac{\frac{(bx+a)^3 \arcsin(bx+a)^2}{3}+\frac{2\arcsin(bx+a)\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{9}-\frac{2(bx+a)^3}{27}-\frac{4bx}{9}-\frac{4a}{9}-\frac{a\left(2\arcsin(bx+a)^2(bx+a)^2+2\arcsin(bx+\right.}{}}{b^3}$
default	$\frac{\frac{(bx+a)^3 \arcsin(bx+a)^2}{3}+\frac{2\arcsin(bx+a)\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{9}-\frac{2(bx+a)^3}{27}-\frac{4bx}{9}-\frac{4a}{9}-\frac{a\left(2\arcsin(bx+a)^2(bx+a)^2+2\arcsin(bx+\right.}{}}{b^3}$

```
[In] int(x^2*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(1/3*(b*x+a)^3*arcsin(b*x+a)^2+2/9*arcsin(b*x+a)*((b*x+a)^2+2)*(1-(b*
x+a)^2)^(1/2)-2/27*(b*x+a)^3-4/9*b*x-4/9*a-1/2*a*(2*arcsin(b*x+a)^2*(b*x+a)
^2+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)-arcsin(b*x+a)^2-(b*x+a)^2)+a
^2*(arcsin(b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.50

$$\int x^2 \arcsin(a+bx)^2 \, dx =$$
$$-\frac{4\,b^3x^3-15\,ab^2x^2+6\,(11\,a^2+4)bx-9\,(2\,b^3x^3+2\,a^3+3\,a)\arcsin(bx+a)^2-6\,(2\,b^2x^2-5\,abx+11\,a^2}{54\,b^3}$$

```
[In] integrate(x^2*arcsin(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/54*(4*b^3*x^3 - 15*a*b^2*x^2 + 6*(11*a^2 + 4)*b*x - 9*(2*b^3*x^3 + 2*a^3
 + 3*a)*arcsin(b*x + a)^2 - 6*(2*b^2*x^2 - 5*a*b*x + 11*a^2 + 4)*sqrt(-b^2*
x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a))/b^3
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.10

$$\int x^2 \arcsin(a+bx)^2 \, dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}^2(a+bx)}{3b^3} - \frac{11a^2x}{9b^2} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{9b^3} + \frac{5ax^2}{18b} - \frac{5ax\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{9b^2} + \frac{a\operatorname{asin}^2(a+bx)}{2b^3} \\ \frac{x^3\operatorname{asin}^2(a)}{3} \end{cases}$$

```
[In] integrate(x**2*asin(b*x+a)**2,x)
```

```
[Out] Piecewise((a**3*asin(a + b*x)**2/(3*b**3) - 11*a**2*x/(9*b**2) + 11*a**2*sq
rt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**3) + 5*a*x**2/(18*b
) - 5*a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**2) + a*
asin(a + b*x)**2/(2*b**3) + x**3*asin(a + b*x)**2/3 - 2*x**3/27 + 2*x**2*sq
rt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b) - 4*x/(9*b**2) + 4*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**3), Ne(b, 0)), (x
**3*asin(a)**2/3, True))
```

Maxima [F]

$$\int x^2 \arcsin(a+bx)^2 \, dx = \int x^2 \arcsin(bx+a)^2 \, dx$$

```
[In] integrate(x^2*arcsin(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + 2*b*inte
grate(1/3*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^3*arctan2(b*x + a, sqrt(b*
x + a + 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.23

$$\int x^2 \arcsin(a+bx)^2\,dx = \frac{(bx+a)a^2 \arcsin{(bx+a)}^2}{b^3} + \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin{(bx+a)}^2}{3\,b^3} - \frac{\left((bx+a)^2-1\right)a\arcsin{(bx+a)}^2}{b^3} - \frac{\sqrt{-(bx+a)^2+1}(bx+a)a\arcsin{(bx+a)}}{b^3} + \frac{2\sqrt{-(bx+a)^2+1}a^2\arcsin{(bx+a)}}{b^3} - \frac{2\,(bx+a)a^2}{b^3} + \frac{(bx+a)\arcsin{(bx+a)}^2}{3\,b^3} - \frac{a\arcsin{(bx+a)}^2}{2\,b^3} - \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}}\arcsin{(bx+a)}}{9\,b^3} - \frac{2\left((bx+a)^2-1\right)(bx+a)}{27\,b^3} + \frac{\left((bx+a)^2-1\right)a}{2\,b^3} + \frac{2\sqrt{-(bx+a)^2+1}\arcsin{(bx+a)}}{3\,b^3} - \frac{14\,(bx+a)}{27\,b^3} + \frac{a}{4\,b^3}$$

```
[In] integrate(x^2*arcsin(b*x+a)^2,x, algorithm="giac")
```

```
[Out] (b*x + a)*a^2*arcsin(b*x + a)^2/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcsi
n(b*x + a)^2/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)^2/b^3 - sqrt(-(b*x +
 a)^2 + 1)*(b*x + a)*a*arcsin(b*x + a)/b^3 + 2*sqrt(-(b*x + a)^2 + 1)*a^2*a
rcsin(b*x + a)/b^3 - 2*(b*x + a)*a^2/b^3 + 1/3*(b*x + a)*arcsin(b*x + a)^2/
b^3 - 1/2*a*arcsin(b*x + a)^2/b^3 - 2/9*(-(b*x + a)^2 + 1)^(3/2)*arcsin(b*x
 + a)/b^3 - 2/27*((b*x + a)^2 - 1)*(b*x + a)/b^3 + 1/2*((b*x + a)^2 - 1)*a/
b^3 + 2/3*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)/b^3 - 14/27*(b*x + a)/b^3
+ 1/4*a/b^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)^2 \, dx = \int x^2 \operatorname{asin}(a+b\,x)^2 \, dx$$

```
[In] int(x^2*asin(a + b*x)^2,x)
[Out] int(x^2*asin(a + b*x)^2, x)
```

3.133 $\int x \arcsin(a+bx)^2 \, dx$

Optimal result

Integrand size = 10, antiderivative size = 130

$$\int x \arcsin(a+bx)^2 \, dx = \frac{2ax}{b} - \frac{(a+bx)^2}{4b^2} - \frac{2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^2} - \frac{\arcsin(a+bx)^2}{4b^2} - \frac{a^2\arcsin(a+bx)^2}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^2$$

```
[Out] 2*a*x/b-1/4*(b*x+a)^2/b^2-1/4*arcsin(b*x+a)^2/b^2-1/2*a^2*arcsin(b*x+a)^2/b^2+1/2*x^2*arcsin(b*x+a)^2-2*a*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^2+1/2*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^2
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.800$, Rules used = {4889, 4827, 4847, 4737, 4767, 8, 4795, 30}

$$\int x \arcsin(a+bx)^2 \, dx = -\frac{a^2\arcsin(a+bx)^2}{2b^2} + \frac{\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)}{2b^2} - \frac{\arcsin(a+bx)^2}{4b^2} - \frac{2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^2} + \frac{1}{2}x^2\arcsin(a+bx)^2 - \frac{(a+bx)^2}{4b^2} + \frac{2ax}{b}$$

```
[In] Int[x*ArcSin[a + b*x]^2,x]
```

```
[Out] (2*a*x)/b - (a + b*x)^2/(4*b^2) - (2*a*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/b^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(2*b^2) - ArcSin
```

```
[a + b*x]^2/(4*b^2) - (a^2*ArcSin[a + b*x]^2)/(2*b^2) + (x^2*ArcSin[a + b*x
]^2)/2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)\arcsin(x)^2\,dx,x,a+bx\right)}{b}\\
&= \frac{1}{2}x^2\arcsin(a+bx)^2-\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)\\
&= \frac{1}{2}x^2\arcsin(a+bx)^2\\
&\quad -\text{Subst}\left(\int \left(\frac{a^2\arcsin(x)}{b^2\sqrt{1-x^2}}-\frac{2ax\arcsin(x)}{b^2\sqrt{1-x^2}}+\frac{x^2\arcsin(x)}{b^2\sqrt{1-x^2}}\right)\,dx,x,a+bx\right)\\
&= \frac{1}{2}x^2\arcsin(a+bx)^2-\frac{\text{Subst}\left(\int \frac{x^2\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{b^2}\\
&\quad +\frac{(2a)\text{Subst}\left(\int \frac{x\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{b^2}-\frac{a^2\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{b^2}\\
&= -\frac{2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^2}+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^2}\\
&\quad -\frac{a^2\arcsin(a+bx)^2}{2b^2}+\frac{1}{2}x^2\arcsin(a+bx)^2-\frac{\text{Subst}\left(\int x\,dx,x,a+bx\right)}{2b^2}\\
&\quad -\frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{2b^2}+\frac{(2a)\text{Subst}\left(\int 1\,dx,x,a+bx\right)}{b^2}\\
&= \frac{2ax}{b}-\frac{(a+bx)^2}{4b^2}-\frac{2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^2}\\
&\quad +\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^2}-\frac{\arcsin(a+bx)^2}{4b^2}\\
&\quad -\frac{a^2\arcsin(a+bx)^2}{2b^2}+\frac{1}{2}x^2\arcsin(a+bx)^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.64

$$\int x \arcsin(a+bx)^2 \, dx$$
$$= \frac{bx(6a-bx)-2(3a-bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)+(-1-2a^2+2b^2x^2)\arcsin(a+bx)^2}{4b^2}$$

```
[In] Integrate[x*ArcSin[a + b*x]^2,x]
```

```
[Out] (b*x*(6*a - b*x) - 2*(3*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a
 + b*x] + (-1 - 2*a^2 + 2*b^2*x^2)*ArcSin[a + b*x]^2)/(4*b^2)
```

Maple [A] (verified)

Time = 0.39 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.95

method	result
derivativedivides	$\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^2}{2}+\frac{\arcsin(bx+a)\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{2}-\frac{\arcsin(bx+a)^2}{4}-\frac{(bx+a)^2}{4}-a\left(\arcsin(bx+a\right.}{b^2}$
default	$\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^2}{2}+\frac{\arcsin(bx+a)\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{2}-\frac{\arcsin(bx+a)^2}{4}-\frac{(bx+a)^2}{4}-a\left(\arcsin(bx+a\right.}{b^2}$

```
[In] int(x*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^2*(1/2*(-1+(b*x+a)^2)*arcsin(b*x+a)^2+1/2*arcsin(b*x+a)*((b*x+a)*(1-(b*
x+a)^2)^(1/2)+arcsin(b*x+a))-1/4*arcsin(b*x+a)^2-1/4*(b*x+a)^2-a*(arcsin(b*
x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.62

$$\int x \arcsin(a+bx)^2 \, dx =$$
$$-\frac{b^2x^2-6\,abx-(2\,b^2x^2-2\,a^2-1)\arcsin\left(bx+a\right)^2-2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx-3\,a)\arcsin\left(bx+\right.}{4\,b^2}$$

```
[In] integrate(x*arcsin(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(b^2*x^2 - 6*a*b*x - (2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a)^2 - 2*sqr
t(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x - 3*a)*arcsin(b*x + a))/b^2
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.06

$$\int x \arcsin(a+bx)^2\,dx$$
$$= \begin{cases} -\frac{a^2 \operatorname{asin}^2(a+bx)}{2b^2} + \frac{3ax}{2b} - \frac{3a\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{2b^2} + \frac{x^2 \operatorname{asin}^2(a+bx)}{2} - \frac{x^2}{4} + \frac{x\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{2b} - \operatorname{asi} \\ \frac{x^2 \operatorname{asin}^2(a)}{2} \end{cases}$$

```
[In] integrate(x*asin(b*x+a)**2,x)
```

```
[Out] Piecewise((-a**2*asin(a + b*x)**2/(2*b**2) + 3*a*x/(2*b) - 3*a*sqrt(-a**2 -
 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(2*b**2) + x**2*asin(a + b*x)**2/2
- x**2/4 + x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(2*b) - as
in(a + b*x)**2/(4*b**2), Ne(b, 0)), (x**2*asin(a)**2/2, True))
```

Maxima [F]

$$\int x \arcsin(a+bx)^2\,dx = \int x \arcsin\left(bx+a\right)^2\,dx$$

```
[In] integrate(x*arcsin(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + b*integr
ate(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2*arctan2(b*x + a, sqrt(b*x + a
+ 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.07

$$\int x \arcsin(a+bx)^2\,dx = -\frac{(bx+a)a\arcsin\left(bx+a\right)^2}{b^2} + \frac{\left((bx+a)^2-1\right)\arcsin\left(bx+a\right)^2}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)\arcsin\left(bx+a\right)}{2\,b^2} - \frac{2\,\sqrt{-(bx+a)^2+1}a\arcsin\left(bx+a\right)}{b^2} + \frac{2\,(bx+a)a}{b^2} + \frac{\arcsin\left(bx+a\right)^2}{4\,b^2} - \frac{(bx+a)^2-1}{4\,b^2} - \frac{1}{8\,b^2}$$

```
[In] integrate(x*arcsin(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -(b*x + a)*a*arcsin(b*x + a)^2/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)^
2/b^2 + 1/2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*arcsin(b*x + a)/b^2 - 2*sqrt(-
(b*x + a)^2 + 1)*a*arcsin(b*x + a)/b^2 + 2*(b*x + a)*a/b^2 + 1/4*arcsin(b*x
 + a)^2/b^2 - 1/4*((b*x + a)^2 - 1)/b^2 - 1/8/b^2
```

Mupad [F(-1)]

Timed out.

$$\int x \arcsin(a+bx)^2 \, dx = \int x \operatorname{asin}(a+b\,x)^2 \, dx$$

```
[In] int(x*asin(a + b*x)^2,x)
```

```
[Out] int(x*asin(a + b*x)^2, x)
```

3.134 $\int \arcsin(a+bx)^2\,dx$

Optimal result

Integrand size = 8, antiderivative size = 47

$$\int \arcsin(a+bx)^2\,dx = -2x + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b}$$

```
[Out] -2*x+(b*x+a)*arcsin(b*x+a)^2/b+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4715, 4767, 8}

$$\int \arcsin(a+bx)^2\,dx = \frac{(a+bx)\arcsin(a+bx)^2}{b} + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b} - 2x$$

```
[In] Int[ArcSin[a + b*x]^2,x]
```

```
[Out] -2*x + (2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/b + ((a + b*x)*ArcSin[a +
b*x]^2)/b
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \arcsin(x)^2\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)\arcsin(a+bx)^2}{b} - \frac{2\text{Subst}\left(\int \frac{x\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\
&= \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b} - \frac{2\text{Subst}\left(\int 1\,dx, x, a+bx\right)}{b}\\
&= -2x + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.04

$$\int \arcsin(a+bx)^2\,dx = \frac{-2(a+bx)+2\sqrt{1-(a+bx)^2}\arcsin(a+bx)+(a+bx)\arcsin(a+bx)^2}{b}$$

```
[In] Integrate[ArcSin[a + b*x]^2,x]
[Out] (-2*(a + b*x) + 2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] + (a + b*x)*ArcSin[
a + b*x]^2)/b
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.02

method	result	size
derivativedivides	$\frac{\arcsin(bx+a)^2(bx+a)-2bx-2a+2\arcsin(bx+a)\sqrt{1-(bx+a)^2}}{b}$	48
default	$\frac{\arcsin(bx+a)^2(bx+a)-2bx-2a+2\arcsin(bx+a)\sqrt{1-(bx+a)^2}}{b}$	48

```
[In] int(arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b*(arcsin(b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.13

$$\int \arcsin(a+bx)^2\,dx = \frac{(bx+a)\arcsin\left(bx+a\right)^2 - 2\,bx + 2\,\sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin\left(bx+a\right)}{b}$$

```
[In] integrate(arcsin(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] ((b*x + a)*arcsin(b*x + a)^2 - 2*b*x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)
*arcsin(b*x + a))/b
```

Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.34

$$\int \arcsin(a+bx)^2\,dx = \begin{cases} \frac{a\operatorname{asin}^2(a+bx)}{b} + x\operatorname{asin}^2(a+bx) - 2x + \frac{2\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{b} & \text{for } b\neq 0 \\ x\operatorname{asin}^2(a) & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(b*x+a)**2,x)
```

```
[Out] Piecewise((a*asin(a + b*x)**2/b + x*asin(a + b*x)**2 - 2*x + 2*sqrt(-a**2 -
 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/b, Ne(b, 0)), (x*asin(a)**2, True))
```

Maxima [F]

$$\int \arcsin(a+bx)^2\,dx = \int \arcsin\left(bx+a\right)^2\,dx$$

```
[In] integrate(arcsin(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + 2*b*integrate(
sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x*arctan2(b*x + a, sqrt(b*x + a + 1)*s
qrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.11

$$\int \arcsin(a+bx)^2\,dx = \frac{(bx+a)\arcsin\left(bx+a\right)^2}{b} + \frac{2\sqrt{-(bx+a)^2+1}\arcsin\left(bx+a\right)}{b} - \frac{2\left(bx+a\right)}{b}$$

```
[In] integrate(arcsin(b*x+a)^2,x, algorithm="giac")
```

```
[Out] (b*x + a)*arcsin(b*x + a)^2/b + 2*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)/b
- 2*(b*x + a)/b
```

Mupad [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.94

$$\int \arcsin(a+bx)^2\,dx = \frac{\left(\mathrm{asin}(a+b\,x)^2-2\right)\,\left(a+b\,x\right)}{b} + \frac{2\,\mathrm{asin}(a+b\,x)\,\sqrt{1-(a+b\,x)^2}}{b}$$

```
[In] int(asin(a + b*x)^2,x)
```

```
[Out] ((asin(a + b*x)^2 - 2)*(a + b*x))/b + (2*asin(a + b*x)*(1 - (a + b*x)^2)^(1
/2))/b
```

3.135 $\int \frac{\arcsin(a+bx)^2}{x}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 271

$$\begin{aligned}\int \frac{\arcsin(a+bx)^2}{x}\,dx = & -\frac{1}{3}i\arcsin(a+bx)^3+\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & +\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & -2i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & -2i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & +2\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+2\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\end{aligned}$$

```
[Out] -1/3*I*arcsin(b*x+a)^3+arcsin(b*x+a)^2*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
/(I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)^2*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
/(I*a+(-a^2+1)^(1/2)))-2*I*arcsin(b*x+a)*polylog(2,(I*(b*x+a)+(1-(b*x+a)^2)
^(1/2))/(I*a-(-a^2+1)^(1/2)))-2*I*arcsin(b*x+a)*polylog(2,(I*(b*x+a)+(1-(b*
x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+2*polylog(3,(I*(b*x+a)+(1-(b*x+a)^2)^(
1/2))/(I*a-(-a^2+1)^(1/2)))+2*polylog(3,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*
a+(-a^2+1)^(1/2)))
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4889, 4825, 4617, 2221, 2611, 2320, 6724}

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = -2i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - 2i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + 2\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 2\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right) + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right) - \frac{1}{3}i\arcsin(a+bx)^3$$

```
[In] Int[ArcSin[a + b*x]^2/x,x]
```

```
[Out] (-1/3*I)*ArcSin[a + b*x]^3 + ArcSin[a + b*x]^2*Log[1 - E^(I*ArcSin[a + b*x]
)/(I*a - Sqrt[1 - a^2])] + ArcSin[a + b*x]^2*Log[1 - E^(I*ArcSin[a + b*x])/
(I*a + Sqrt[1 - a^2])] - (2*I)*ArcSin[a + b*x]*PolyLog[2, E^(I*ArcSin[a + b
*x])/(I*a - Sqrt[1 - a^2])] - (2*I)*ArcSin[a + b*x]*PolyLog[2, E^(I*ArcSin[
a + b*x])/(I*a + Sqrt[1 - a^2])] + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a
- Sqrt[1 - a^2])] + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2]
)]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{-\frac{a}{b}+\frac{x}{b}}\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{x^2\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{1}{3}i\arcsin(a+bx)^3 + \frac{i\text{Subst}\left(\int \frac{e^{ix}x^2}{-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{b}$$
$$+ \frac{i\text{Subst}\left(\int \frac{e^{ix}x^2}{-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$- 2\text{Subst}\left(\int x\log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)$$
$$- 2\text{Subst}\left(\int x\log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)$$

$$= -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$- 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$- 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$+ 2i\text{Subst}\left(\int \text{PolyLog}\left(2,-\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)$$
$$+ 2i\text{Subst}\left(\int \text{PolyLog}\left(2,-\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)$$

$$= -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + 2\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{x}{ia-\sqrt{1-a^2}}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right) + 2\text{Subst}\left(\int\frac{\text{PolyLog}\left(2,\frac{x}{ia+\sqrt{1-a^2}}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right)$$

$$= -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + 2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.14

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) + \arcsin(a+bx)^2\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 2i\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 2i\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) + 2\,\mathrm{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 2\,\mathrm{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

```
[In] Integrate[ArcSin[a + b*x]^2/x,x]
```

```
[Out] (-1/3*I)*ArcSin[a + b*x]^3 + ArcSin[a + b*x]^2*Log[1 + E^(I*ArcSin[a + b*x]
)/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]^2*Log[1 + E^(I*ArcS
in[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - (2*I)*ArcSin[a + b*x]*Po
lyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))] - (2*
I)*ArcSin[a + b*x]*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b + Sqrt[1
 - a^2]/b)*b))] + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])]
 + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])]
```

Maple [F]

$$\int \frac{\arcsin\left(bx+a\right)^2}{x}dx$$

```
[In] int(arcsin(b*x+a)^2/x,x)
```

```
[Out] int(arcsin(b*x+a)^2/x,x)
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)^2/x, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\operatorname{asin}^2\left(a+bx\right)}{x}\,dx$$

```
[In] integrate(asin(b*x+a)**2/x,x)
[Out] Integral(asin(a + b*x)**2/x, x)
```

Maxima [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x,x, algorithm="maxima")
[Out] integrate(arcsin(b*x + a)^2/x, x)
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x,x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\operatorname{asin}(a+b\,x)^2}{x}\,dx$$

```
[In] int(asin(a + b*x)^2/x,x)
[Out] int(asin(a + b*x)^2/x, x)
```

3.136 $\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 230

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = -\frac{\arcsin(a+bx)^2}{x} - \frac{2b\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} + \frac{2b\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} + \frac{2ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} - \frac{2ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}}$$

```
[Out] -arcsin(b*x+a)^2/x-2*b*arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(
I*a-(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)+2*b*arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b
*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)+2*I*b*polylog(2,(I*(b*
x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)-2*I*b*polylo
g(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.90, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used

= {4889, 4827, 4857, 3404, 2296, 2221, 2317, 2438}

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \frac{2b\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} - \frac{2b\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} + \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} - \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)}{\sqrt{a^2-1}} - \frac{\arcsin(a+bx)^2}{x}$$

```
[In] Int[ArcSin[a + b*x]^2/x^2,x]
```

```
[Out] -(ArcSin[a + b*x]^2/x) + ((2*I)*b*ArcSin[a + b*x]*Log[1 + (I*E^(I*ArcSin[a
+ b*x]))/(a - Sqrt[-1 + a^2])])/Sqrt[-1 + a^2] - ((2*I)*b*ArcSin[a + b*x]*L
og[1 + (I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/Sqrt[-1 + a^2] + (2
*b*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])])/Sqrt[-1 +
 a^2] - (2*b*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])
/Sqrt[-1 + a^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\arcsin(a+bx)^2}{x} + 2\text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{\arcsin(a+bx)^2}{x} + 2\text{Subst}\left(\int \frac{x}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)\\
&= -\frac{\arcsin(a+bx)^2}{x} + 4\text{Subst}\left(\int \frac{e^{ix}x}{\frac{i}{b}-\frac{2ae^{ix}}{b}-\frac{ie^{2ix}}{b}}\,dx, x, \arcsin(a+bx)\right)
\end{aligned}
$$

$$= -\frac{\arcsin(a+bx)^2}{x} - \frac{(4i)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}} + \frac{(4i)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}$$

$$= -\frac{\arcsin(a+bx)^2}{x} + \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{(2ib)\text{Subst}\left(\int \log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}} - \frac{(2ib)\text{Subst}\left(\int \log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}$$

$$= -\frac{\arcsin(a+bx)^2}{x} + \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{(2b)\text{Subst}\left(\int \frac{\log\left(1-\frac{2ix}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right)}{\sqrt{-1+a^2}} - \frac{(2b)\text{Subst}\left(\int \frac{\log\left(1-\frac{2ix}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right)}{\sqrt{-1+a^2}}$$

$$= -\frac{\arcsin(a+bx)^2}{x} + \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{2ib\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{2b\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{2b\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.90

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \frac{-\sqrt{-1+a^2}\arcsin(a+bx)^2 + 2ibx\arcsin(a+bx)\left(\log\left(\frac{a-\sqrt{-1+a^2}+ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right) - \log\left(\frac{a+\sqrt{-1+a^2}+ie^{i\arcsin(a+b}}{a+\sqrt{-1+a^2}}\right.\right.}{\sqrt{-1+a^2}x}$$

```
[In] Integrate[ArcSin[a + b*x]^2/x^2,x]
```

```
[Out] (-(Sqrt[-1 + a^2]*ArcSin[a + b*x]^2) + (2*I)*b*x*ArcSin[a + b*x]*(Log[(a -
Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])] - Log[(a +
Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])]) + 2*b*x*Po
lyLog[2, (I*E^(I*ArcSin[a + b*x]))/(-a + Sqrt[-1 + a^2])] - 2*b*x*PolyLog[2
, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/(Sqrt[-1 + a^2]*x)
```

Maple [A] (verified)

Time = 0.91 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.31

method	result
derivativedivides	$b\left(-\frac{\arcsin(bx+a)^2}{bx} - \frac{2\arcsin(bx+a)\sqrt{-a^2+1}\left(\ln\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)-\ln\left(\frac{-ia+\sqrt{-a^2+1}+i(bx+a)}{-ia+\sqrt{-a^2}}\right.\right.}{a^2-1}\right.$
default	$b\left(-\frac{\arcsin(bx+a)^2}{bx} - \frac{2\arcsin(bx+a)\sqrt{-a^2+1}\left(\ln\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)-\ln\left(\frac{-ia+\sqrt{-a^2+1}+i(bx+a)}{-ia+\sqrt{-a^2}}\right.\right.}{a^2-1}\right.$

```
[In] int(arcsin(b*x+a)^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] b*(-arcsin(b*x+a)^2/b/x-2*arcsin(b*x+a)*(-a^2+1)^(1/2)*(ln((I*a+(-a^2+1)^(1
/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))-ln((-I*a+(-a^2+1)^
```

```
(1/2)+I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(-I*a+(-a^2+1)^(1/2))))/(a^2-1)+2*I*(-
a^2+1)^(1/2)/(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2
))/(I*a+(-a^2+1)^(1/2)))-2*I*(-a^2+1)^(1/2)/(a^2-1)*dilog((-I*a+(-a^2+1)^(1
/2)+I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(-I*a+(-a^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2} \, dx = \int \frac{\arcsin\left(bx+a\right)^2}{x^2} \, dx$$

```
[In] integrate(arcsin(b*x+a)^2/x^2,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)^2/x^2, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2} \, dx = \int \frac{\operatorname{asin}^2\left(a+bx\right)}{x^2} \, dx$$

```
[In] integrate(asin(b*x+a)**2/x**2,x)
[Out] Integral(asin(a + b*x)**2/x**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^2}{x^2} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)^2/x^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{x^2}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x^2,x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)^2/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{x^2}\,dx$$

```
[In] int(asin(a + b*x)^2/x^2,x)
[Out] int(asin(a + b*x)^2/x^2, x)
```

3.137 $\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 272

$$\begin{aligned}\int \frac{\arcsin(a+bx)^2}{x^3}\,dx &= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x}-\frac{\arcsin(a+bx)^2}{2x^2}\\
&\quad-\frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}\\
&\quad+\frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}+\frac{b^2\log(x)}{1-a^2}\\
&\quad-\frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}+\frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}\end{aligned}$$

```
[Out] -1/2*arcsin(b*x+a)^2/x^2+b^2*ln(x)/(-a^2+1)-I*a*b^2*arcsin(b*x+a)*ln(1+I*(I
*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(3/2)+I*a*b^2*arcs
in(b*x+a)*ln(1+I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2-1)
^(3/2)-a*b^2*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1/2))
)/(a^2-1)^(3/2)+a*b^2*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-
1)^(1/2)))/(a^2-1)^(3/2)-b*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/(-a^2+1)/x
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.917, Rules used = {4889, 4827, 4857, 3405, 3404, 2296, 2221, 2317, 2438, 2747, 31}

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = -\frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{(a^2-1)^{3/2}}+\frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)}{(a^2-1)^{3/2}} -\frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{(a^2-1)^{3/2}} +\frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)}{(a^2-1)^{3/2}} -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x}+\frac{b^2\log(x)}{1-a^2}-\frac{\arcsin(a+bx)^2}{2x^2}$$

```
[In] Int[ArcSin[a + b*x]^2/x^3,x]
```

```
[Out] -((b*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/((1 - a^2)*x)) - ArcSin[a + b*x
]^2/(2*x^2) - (I*a*b^2*ArcSin[a + b*x]*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a
 - Sqrt[-1 + a^2])])/(-1 + a^2)^(3/2) + (I*a*b^2*ArcSin[a + b*x]*Log[1 + (I
*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/(-1 + a^2)^(3/2) + (b^2*Log[
x])/(1 - a^2) - (a*b^2*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1
 + a^2])])/(-1 + a^2)^(3/2) + (a*b^2*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x])
)/(a + Sqrt[-1 + a^2])])/(-1 + a^2)^(3/2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
```

```
2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2747

```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Dist[1/(b^p*f), Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)/
2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
- 1)/2] && NeQ[a^2 - b^2, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 3405

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Dist[a/(a^2 - b^2), Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x],
 x] - Dist[b*d*(m/(f*(a^2 - b^2))), Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(a
+ b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 - b^
2, 0] && IGtQ[m, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{\left(-\frac{a}{b}+\frac{x}{b}\right)^3}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{\arcsin(a+bx)^2}{2x^2} + \text{Subst}\left(\int \frac{\arcsin(x)}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= -\frac{\arcsin(a+bx)^2}{2x^2} + \text{Subst}\left(\int \frac{x}{\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2}\,dx, x, \arcsin(a+bx)\right)$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} + \frac{b\text{Subst}\left(\int \frac{\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)}{1-a^2} + \frac{(ab)\text{Subst}\left(\int \frac{x}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)}{1-a^2}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} + \frac{(2ab)\text{Subst}\left(\int \frac{e^{ix}x}{\frac{i}{b}-\frac{2ae^{ix}}{b}-\frac{ie^{2ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{1-a^2} + \frac{b^2\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+x}\,dx, x, \frac{a}{b}+x\right)}{1-a^2}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} + \frac{b^2\log(x)}{1-a^2} + \frac{(2iab)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{(-1+a^2)^{3/2}} - \frac{(2iab)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{(-1+a^2)^{3/2}}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} - \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{b^2\log(x)}{1-a^2} - \frac{(iab^2)\,\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{(-1+a^2)^{3/2}} + \frac{(iab^2)\,\text{Subst}\left(\int\log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{(-1+a^2)^{3/2}}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} - \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{b^2\log(x)}{1-a^2} - \frac{(ab^2)\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2ix}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right)}{(-1+a^2)^{3/2}} + \frac{(ab^2)\,\text{Subst}\left(\int\frac{\log\left(1-\frac{2ix}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)}{x}dx, x, e^{i\arcsin(a+bx)}\right)}{(-1+a^2)^{3/2}}$$

$$= -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} - \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{b^2\log(x)}{1-a^2} - \frac{ab^2\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{ab^2\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.15

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \frac{2\sqrt{-1+a^2}bx\sqrt{1-(a+bx)^2}\arcsin(a+bx)+\sqrt{-1+a^2}\arcsin(a+bx)^2-a^2\sqrt{-1+a^2}\arcsin(a+bx)^2-}{}$$

```
[In] Integrate[ArcSin[a + b*x]^2/x^3,x]
```

```
[Out] (2*Sqrt[-1 + a^2]*b*x*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] + Sqrt[-1 + a^2
]*ArcSin[a + b*x]^2 - a^2*Sqrt[-1 + a^2]*ArcSin[a + b*x]^2 - (2*I)*a*b^2*x^
```

```
2*ArcSin[a + b*x]*Log[(a - Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a - S
qrt[-1 + a^2])] + (2*I)*a*b^2*x^2*ArcSin[a + b*x]*Log[(a + Sqrt[-1 + a^2] +
 I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])] - 2*Sqrt[-1 + a^2]*b^2*x^2*
Log[x] - 2*a*b^2*x^2*PolyLog[2, (I*E^(I*ArcSin[a + b*x]))/(-a + Sqrt[-1 + a
^2])] + 2*a*b^2*x^2*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 +
a^2])])/(2*(-1 + a^2)^(3/2)*x^2)
```

Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 521, normalized size of antiderivative = 1.92

method	result
derivativedivides	$b^2\left(-\frac{\arcsin(bx+a)\left(-\arcsin(bx+a)+2ia^2-4ia(bx+a)+a^2\arcsin(bx+a)+2a\sqrt{1-(bx+a)^2}+2i(bx+a)^2-2(bx+a)\sqrt{1}\right.}{2(a^2-1)b^2x^2}\right.$
default	$b^2\left(-\frac{\arcsin(bx+a)\left(-\arcsin(bx+a)+2ia^2-4ia(bx+a)+a^2\arcsin(bx+a)+2a\sqrt{1-(bx+a)^2}+2i(bx+a)^2-2(bx+a)\sqrt{1}\right.}{2(a^2-1)b^2x^2}\right.$

```
[In] int(arcsin(b*x+a)^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] b^2*(-1/2*arcsin(b*x+a)*(-arcsin(b*x+a)+2*I*a^2-4*I*a*(b*x+a)+a^2*arcsin(b*
x+a)+2*a*(1-(b*x+a)^2)^(1/2)+2*I*(b*x+a)^2-2*(b*x+a)*(1-(b*x+a)^2)^(1/2))/(
a^2-1)/b^2/x^2-1/(a^2-1)*ln(I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2+2*a*(I*(b*x
+a)+(1-(b*x+a)^2)^(1/2))-I)+2/(a^2-1)*ln(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))+(-a
^2+1)^(1/2)/(a^2-1)^2*a*arcsin(b*x+a)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(
b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))-(-a^2+1)^(1/2)/(a^2-1)^2*a*arcsin(b*
x+a)*ln((I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1
/2)))-I*(-a^2+1)^(1/2)/(a^2-1)^2*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*
x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))*a+I*(-a^2+1)^(1/2)/(a^2-1)^2*dilog((I*
a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))*a)
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx=\int \frac{\arcsin\left(bx+a\right)^2}{x^3}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(arcsin(b*x + a)^2/x^3, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \int \frac{\operatorname{asin}^2(a+bx)}{x^3}\,dx$$

```
[In] integrate(asin(b*x+a)**2/x**3,x)
```

```
[Out] Integral(asin(a + b*x)**2/x**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)^2/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \int \frac{\arcsin(bx+a)^2}{x^3}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(arcsin(b*x + a)^2/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \int \frac{\operatorname{asin}(a+b\,x)^2}{x^3}\,dx$$

```
[In] int(asin(a + b*x)^2/x^3,x)
```

```
[Out] int(asin(a + b*x)^2/x^3, x)
```

3.138 $\int x^2 \arcsin(a+bx)^3\,dx$

Optimal result

Integrand size = 12, antiderivative size = 371

$$\begin{aligned}\int x^2 \arcsin(a+bx)^3\,dx = & -\frac{14\sqrt{1-(a+bx)^2}}{9b^3}-\frac{6a^2\sqrt{1-(a+bx)^2}}{b^3} \\ & +\frac{3a(a+bx)\sqrt{1-(a+bx)^2}}{4b^3}+\frac{2(1-(a+bx)^2)^{3/2}}{27b^3} \\ & -\frac{3a\arcsin(a+bx)}{4b^3}-\frac{4(a+bx)\arcsin(a+bx)}{3b^3} \\ & -\frac{6a^2(a+bx)\arcsin(a+bx)}{b^3}+\frac{3a(a+bx)^2\arcsin(a+bx)}{2b^3} \\ & -\frac{2(a+bx)^3\arcsin(a+bx)}{9b^3}+\frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} \\ & +\frac{3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^3} \\ & -\frac{3a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b^3} \\ & +\frac{(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} \\ & +\frac{a\arcsin(a+bx)^3}{2b^3}+\frac{a^3\arcsin(a+bx)^3}{3b^3}+\frac{1}{3}x^3\arcsin(a+bx)^3\end{aligned}$$

```
[Out] 2/27*(1-(b*x+a)^2)^(3/2)/b^3-3/4*a*arcsin(b*x+a)/b^3-4/3*(b*x+a)*arcsin(b*x
+a)/b^3-6*a^2*(b*x+a)*arcsin(b*x+a)/b^3+3/2*a*(b*x+a)^2*arcsin(b*x+a)/b^3-2
/9*(b*x+a)^3*arcsin(b*x+a)/b^3+1/2*a*arcsin(b*x+a)^3/b^3+1/3*a^3*arcsin(b*x
+a)^3/b^3+1/3*x^3*arcsin(b*x+a)^3-14/9*(1-(b*x+a)^2)^(1/2)/b^3-6*a^2*(1-(b*
x+a)^2)^(1/2)/b^3+3/4*a*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2/3*arcsin(b*x+a)^2
*(1-(b*x+a)^2)^(1/2)/b^3+3*a^2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^3-3/2*
a*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^3+1/3*(b*x+a)^2*arcsin(b*x+
a)^2*(1-(b*x+a)^2)^(1/2)/b^3
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.917, Rules used = {4889, 4827, 4857, 3398, 3377, 2718, 3392, 30, 2715, 8, 2713}

$$\int x^2 \arcsin(a+bx)^3\,dx = \frac{a^3\arcsin(a+bx)^3}{3b^3}-\frac{6a^2(a+bx)\arcsin(a+bx)}{b^3}+\frac{3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^3}-\frac{6a^2\sqrt{1-(a+bx)^2}}{b^3}-\frac{2(a+bx)^3\arcsin(a+bx)}{9b^3}+\frac{\sqrt{1-(a+bx)^2}(a+bx)^2\arcsin(a+bx)^2}{3b^3}+\frac{3a(a+bx)^2\arcsin(a+bx)}{2b^3}-\frac{3a\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)^2}{2b^3}-\frac{4(a+bx)\arcsin(a+bx)}{3b^3}+\frac{a\arcsin(a+bx)^3}{2b^3}+\frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3}-\frac{3a\arcsin(a+bx)}{4b^3}+\frac{1}{3}x^3\arcsin(a+bx)^3+\frac{3a\sqrt{1-(a+bx)^2}(a+bx)}{4b^3}+\frac{2(1-(a+bx)^2)^{3/2}}{27b^3}-\frac{14\sqrt{1-(a+bx)^2}}{9b^3}$$

```
[In] Int[x^2*ArcSin[a + b*x]^3,x]
```

```
[Out] (-14*Sqrt[1 - (a + b*x)^2])/(9*b^3) - (6*a^2*Sqrt[1 - (a + b*x)^2])/b^3 + (
3*a*(a + b*x)*Sqrt[1 - (a + b*x)^2])/(4*b^3) + (2*(1 - (a + b*x)^2)^(3/2))/
(27*b^3) - (3*a*ArcSin[a + b*x])/(4*b^3) - (4*(a + b*x)*ArcSin[a + b*x])/(3
*b^3) - (6*a^2*(a + b*x)*ArcSin[a + b*x])/b^3 + (3*a*(a + b*x)^2*ArcSin[a +
 b*x])/(2*b^3) - (2*(a + b*x)^3*ArcSin[a + b*x])/(9*b^3) + (2*Sqrt[1 - (a +
 b*x)^2]*ArcSin[a + b*x]^2)/(3*b^3) + (3*a^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a
 + b*x]^2)/b^3 - (3*a*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2
*b^3) + ((a + b*x)^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(3*b^3) + (a*
ArcSin[a + b*x]^3)/(2*b^3) + (a^3*ArcSin[a + b*x]^3)/(3*b^3) + (x^3*ArcSin[
a + b*x]^3)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
```

```
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^2 \arcsin(x)^3\,dx, x, a+bx\right)}{b}\\
&= \frac{1}{3}x^3\arcsin(a+bx)^3 - \text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^3 \arcsin(x)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= \frac{1}{3}x^3\arcsin(a+bx)^3 - \text{Subst}\left(\int x^2\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^3\,dx, x, \arcsin(a+bx)\right)\\
&= \frac{1}{3}x^3\arcsin(a+bx)^3 - \text{Subst}\left(\int \left(-\frac{a^3x^2}{b^3}+\frac{3a^2x^2\sin(x)}{b^3}-\frac{3ax^2\sin^2(x)}{b^3}\right.\right.\\
&\qquad\left.\left.+\frac{x^2\sin^3(x)}{b^3}\right)\,dx, x, \arcsin(a+bx)\right)\\
&= \frac{a^3\arcsin(a+bx)^3}{3b^3}+\frac{1}{3}x^3\arcsin(a+bx)^3-\frac{\text{Subst}\left(\int x^2\sin^3(x)\,dx, x, \arcsin(a+bx)\right)}{b^3}\\
&\quad+\frac{(3a)\text{Subst}\left(\int x^2\sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{b^3}\\
&\quad-\frac{(3a^2)\,\text{Subst}\left(\int x^2\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3a(a+bx)^2 \arcsin(a+bx)}{2b^3} - \frac{2(a+bx)^3 \arcsin(a+bx)}{9b^3} \\
&+ \frac{3a^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{b^3} - \frac{3a(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{2b^3} \\
&+ \frac{(a+bx)^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{3b^3} + \frac{a^3 \arcsin(a+bx)^3}{3b^3} \\
&+ \frac{1}{3}x^3 \arcsin(a+bx)^3 + \frac{2\text{Subst}\left(\int \sin^3(x)\,dx, x, \arcsin(a+bx)\right)}{9b^3} \\
&- \frac{2\text{Subst}\left(\int x^2 \sin(x)\,dx, x, \arcsin(a+bx)\right)}{3b^3} \\
&+ \frac{(3a)\text{Subst}\left(\int x^2\,dx, x, \arcsin(a+bx)\right)}{2b^3} \\
&- \frac{(3a)\text{Subst}\left(\int \sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{2b^3} \\
&- \frac{(6a^2)\,\text{Subst}(\int x\cos(x)\,dx, x, \arcsin(a+bx))}{b^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3a(a+bx)\sqrt{1-(a+bx)^2}}{4b^3} - \frac{6a^2(a+bx)\arcsin(a+bx)}{b^3} \\
&+ \frac{3a(a+bx)^2 \arcsin(a+bx)}{2b^3} - \frac{2(a+bx)^3 \arcsin(a+bx)}{9b^3} \\
&+ \frac{2\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{3b^3} + \frac{3a^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{b^3} \\
&- \frac{3a(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{2b^3} \\
&+ \frac{(a+bx)^2\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{3b^3} \\
&+ \frac{a \arcsin(a+bx)^3}{2b^3} + \frac{a^3 \arcsin(a+bx)^3}{3b^3} + \frac{1}{3}x^3 \arcsin(a+bx)^3 \\
&- \frac{2\text{Subst}\left(\int (1-x^2)\,dx, x, \sqrt{1-(a+bx)^2}\right)}{9b^3} \\
&- \frac{4\text{Subst}(\int x\cos(x)\,dx, x, \arcsin(a+bx))}{3b^3} - \frac{(3a)\text{Subst}(\int 1\,dx, x, \arcsin(a+bx))}{4b^3} \\
&+ \frac{(6a^2)\,\text{Subst}(\int \sin(x)\,dx, x, \arcsin(a+bx))}{b^3}
\end{aligned}
$$

$$= -\frac{2\sqrt{1-(a+bx)^2}}{9b^3} - \frac{6a^2\sqrt{1-(a+bx)^2}}{b^3} + \frac{3a(a+bx)\sqrt{1-(a+bx)^2}}{4b^3} + \frac{2(1-(a+bx)^2)^{3/2}}{27b^3} - \frac{3a\arcsin(a+bx)}{4b^3} - \frac{4(a+bx)\arcsin(a+bx)}{3b^3} - \frac{6a^2(a+bx)\arcsin(a+bx)}{b^3} + \frac{3a(a+bx)^2\arcsin(a+bx)}{2b^3} - \frac{2(a+bx)^3\arcsin(a+bx)}{9b^3} + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} + \frac{3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^3} - \frac{3a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b^3} + \frac{(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} + \frac{a\arcsin(a+bx)^3}{2b^3} + \frac{a^3\arcsin(a+bx)^3}{3b^3} + \frac{1}{3}x^3\arcsin(a+bx)^3 + \frac{4\text{Subst}(\int\sin(x)\,dx, x, \arcsin(a+bx))}{3b^3}$$

$$= -\frac{14\sqrt{1-(a+bx)^2}}{9b^3} - \frac{6a^2\sqrt{1-(a+bx)^2}}{b^3} + \frac{3a(a+bx)\sqrt{1-(a+bx)^2}}{4b^3} + \frac{2(1-(a+bx)^2)^{3/2}}{27b^3} - \frac{3a\arcsin(a+bx)}{4b^3} - \frac{4(a+bx)\arcsin(a+bx)}{3b^3} - \frac{6a^2(a+bx)\arcsin(a+bx)}{b^3} + \frac{3a(a+bx)^2\arcsin(a+bx)}{2b^3} - \frac{2(a+bx)^3\arcsin(a+bx)}{9b^3} + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} + \frac{3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^3} - \frac{3a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b^3} + \frac{(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} + \frac{a\arcsin(a+bx)^3}{2b^3} + \frac{a^3\arcsin(a+bx)^3}{3b^3} + \frac{1}{3}x^3\arcsin(a+bx)^3$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.49

$$\int x^2\arcsin(a+bx)^3\,dx$$
$$= \frac{-\sqrt{1-a^2-2abx-b^2x^2}(160+575a^2-65abx+8b^2x^2) - 3(170a^3+132a^2bx+a(75-30b^2x^2)+8bx(6+}{}$$

```
[In] Integrate[x^2*ArcSin[a + b*x]^3,x]
```

```
[Out] (-(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(160 + 575*a^2 - 65*a*b*x + 8*b^2*x^2)
) - 3*(170*a^3 + 132*a^2*b*x + a*(75 - 30*b^2*x^2) + 8*b*x*(6 + b^2*x^2))*A
rcSin[a + b*x] + 18*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(4 + 11*a^2 - 5*a*b*x
 + 2*b^2*x^2)*ArcSin[a + b*x]^2 + 18*(3*a + 2*a^3 + 2*b^3*x^3)*ArcSin[a + b
*x]^3)/(108*b^3)
```

Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 294, normalized size of antiderivative = 0.79

method	result
derivativedivides	$\frac{\frac{\arcsin(bx+a)^3(bx+a)^3}{3}+\frac{\arcsin(bx+a)^2\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{3}-\frac{4\sqrt{1-(bx+a)^2}}{3}-\frac{4\arcsin(bx+a)(bx+a)}{3}-\frac{2\arcsin(bx+a)(bx+a)}{9}}{}$
default	$\frac{\frac{\arcsin(bx+a)^3(bx+a)^3}{3}+\frac{\arcsin(bx+a)^2\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{3}-\frac{4\sqrt{1-(bx+a)^2}}{3}-\frac{4\arcsin(bx+a)(bx+a)}{3}-\frac{2\arcsin(bx+a)(bx+a)}{9}}{}$

```
[In] int(x^2*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(1/3*arcsin(b*x+a)^3*(b*x+a)^3+1/3*arcsin(b*x+a)^2*((b*x+a)^2+2)*(1-(
b*x+a)^2)^(1/2)-4/3*(1-(b*x+a)^2)^(1/2)-4/3*arcsin(b*x+a)*(b*x+a)-2/9*arcsi
n(b*x+a)*(b*x+a)^3-2/27*((b*x+a)^2+2)*(1-(b*x+a)^2)^(1/2)-1/4*a*(4*arcsin(b
*x+a)^3*(b*x+a)^2+6*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)*(b*x+a)-2*arcsin(b*
x+a)^3-6*arcsin(b*x+a)*(b*x+a)^2-3*(b*x+a)*(1-(b*x+a)^2)^(1/2)+3*arcsin(b*x
+a))+a^2*(arcsin(b*x+a)^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-6*(
1-(b*x+a)^2)^(1/2)-6*arcsin(b*x+a)*(b*x+a)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.41

$$\int x^2 \arcsin(a+bx)^3\,dx$$
$$=\frac{18\left(2\,b^3x^3+2\,a^3+3\,a\right)\arcsin\left(bx+a\right)^3-3\left(8\,b^3x^3-30\,ab^2x^2+170\,a^3+12\left(11\,a^2+4\right)bx+75\,a\right)\arcsin\left(\right.}{}$$

```
[In] integrate(x^2*arcsin(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/108*(18*(2*b^3*x^3 + 2*a^3 + 3*a)*arcsin(b*x + a)^3 - 3*(8*b^3*x^3 - 30*a
*b^2*x^2 + 170*a^3 + 12*(11*a^2 + 4)*b*x + 75*a)*arcsin(b*x + a) - (8*b^2*x
^2 - 65*a*b*x - 18*(2*b^2*x^2 - 5*a*b*x + 11*a^2 + 4)*arcsin(b*x + a)^2 + 5
75*a^2 + 160)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b^3
```

Sympy [A] (verification not implemented)

Time = 0.44 (sec) , antiderivative size = 432, normalized size of antiderivative = 1.16

$$\int x^2 \arcsin(a+bx)^3 \, dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}^3(a+bx)}{3b^3} - \frac{85a^3 \operatorname{asin}(a+bx)}{18b^3} - \frac{11a^2 x \operatorname{asin}(a+bx)}{3b^2} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{6b^3} - \frac{575a^2\sqrt{-a^2-2abx-b^2x^2+1}}{108b^3} + 5 \\ \frac{x^3 \operatorname{asin}^3(a)}{3} \end{cases}$$

```
[In] integrate(x**2*asin(b*x+a)**3,x)
```

```
[Out] Piecewise((a**3*asin(a + b*x)**3/(3*b**3) - 85*a**3*asin(a + b*x)/(18*b**3)
 - 11*a**2*x*asin(a + b*x)/(3*b**2) + 11*a**2*sqrt(-a**2 - 2*a*b*x - b**2*x
**2 + 1)*asin(a + b*x)**2/(6*b**3) - 575*a**2*sqrt(-a**2 - 2*a*b*x - b**2*x
**2 + 1)/(108*b**3) + 5*a*x**2*asin(a + b*x)/(6*b) - 5*a*x*sqrt(-a**2 - 2*a
*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(6*b**2) + 65*a*x*sqrt(-a**2 - 2*a*b
*x - b**2*x**2 + 1)/(108*b**2) + a*asin(a + b*x)**3/(2*b**3) - 25*a*asin(a
+ b*x)/(12*b**3) + x**3*asin(a + b*x)**3/3 - 2*x**3*asin(a + b*x)/9 + x**2*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(3*b) - 2*x**2*sqrt(
-a**2 - 2*a*b*x - b**2*x**2 + 1)/(27*b) - 4*x*asin(a + b*x)/(3*b**2) + 2*sq
rt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(3*b**3) - 40*sqrt(-a*
*2 - 2*a*b*x - b**2*x**2 + 1)/(27*b**3), Ne(b, 0)), (x**3*asin(a)**3/3, Tru
e))
```

Maxima [F]

$$\int x^2 \arcsin(a+bx)^3 \, dx = \int x^2 \arcsin\left(bx+a\right)^3 \, dx$$

```
[In] integrate(x^2*arcsin(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + b*integr
ate(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^3*arctan2(b*x + a, sqrt(b*x + a
+ 1)*sqrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.05

$$\int x^2 \arcsin(a+bx)^3\,dx = \frac{(bx+a)a^2\arcsin(bx+a)^3}{b^3} + \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)^3}{3\,b^3} - \frac{\left((bx+a)^2-1\right)a\arcsin(bx+a)^3}{b^3} - \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a\arcsin(bx+a)^2}{2\,b^3} + \frac{3\sqrt{-(bx+a)^2+1}a^2\arcsin(bx+a)^2}{b^3} - \frac{6\,(bx+a)a^2\arcsin(bx+a)}{b^3} + \frac{(bx+a)\arcsin(bx+a)^3}{3\,b^3} - \frac{a\arcsin(bx+a)^3}{2\,b^3} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}\arcsin(bx+a)^2}{3\,b^3} - \frac{2\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)}{9\,b^3} + \frac{3\left((bx+a)^2-1\right)a\arcsin(bx+a)}{2\,b^3} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a}{4\,b^3} - \frac{6\sqrt{-(bx+a)^2+1}a^2}{b^3} + \frac{\sqrt{-(bx+a)^2+1}\arcsin(bx+a)^2}{b^3} - \frac{14\,(bx+a)\arcsin(bx+a)}{9\,b^3} + \frac{3\,a\arcsin(bx+a)}{4\,b^3} + \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{27\,b^3} - \frac{14\sqrt{-(bx+a)^2+1}}{9\,b^3}$$

```
[In] integrate(x^2*arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] (b*x + a)*a^2*arcsin(b*x + a)^3/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcsi
n(b*x + a)^3/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)^3/b^3 - 3/2*sqrt(-(b
*x + a)^2 + 1)*(b*x + a)*a*arcsin(b*x + a)^2/b^3 + 3*sqrt(-(b*x + a)^2 + 1)
*a^2*arcsin(b*x + a)^2/b^3 - 6*(b*x + a)*a^2*arcsin(b*x + a)/b^3 + 1/3*(b*x
 + a)*arcsin(b*x + a)^3/b^3 - 1/2*a*arcsin(b*x + a)^3/b^3 - 1/3*(-(b*x + a)
^2 + 1)^(3/2)*arcsin(b*x + a)^2/b^3 - 2/9*((b*x + a)^2 - 1)*(b*x + a)*arcsi
n(b*x + a)/b^3 + 3/2*((b*x + a)^2 - 1)*a*arcsin(b*x + a)/b^3 + 3/4*sqrt(-(b
```

```
*x + a)^2 + 1)*(b*x + a)*a/b^3 - 6*sqrt(-(b*x + a)^2 + 1)*a^2/b^3 + sqrt(-(
b*x + a)^2 + 1)*arcsin(b*x + a)^2/b^3 - 14/9*(b*x + a)*arcsin(b*x + a)/b^3
+ 3/4*a*arcsin(b*x + a)/b^3 + 2/27*(-(b*x + a)^2 + 1)^(3/2)/b^3 - 14/9*sqrt
(-(b*x + a)^2 + 1)/b^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)^3 \, dx = \int x^2 \operatorname{asin}(a+b\,x)^3 \, dx$$

```
[In] int(x^2*asin(a + b*x)^3,x)
[Out] int(x^2*asin(a + b*x)^3, x)
```

3.139 $\int x \arcsin(a+bx)^3 \, dx$

Optimal result

Integrand size = 10, antiderivative size = 211

$$\int x \arcsin(a+bx)^3 \, dx = \frac{6a\sqrt{1-(a+bx)^2}}{b^2} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}}{8b^2} + \frac{3\arcsin(a+bx)}{8b^2} + \frac{6a(a+bx)\arcsin(a+bx)}{b^2} - \frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} - \frac{\arcsin(a+bx)^3}{4b^2} - \frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3$$

```
[Out] 3/8*arcsin(b*x+a)/b^2+6*a*(b*x+a)*arcsin(b*x+a)/b^2-3/4*(b*x+a)^2*arcsin(b*
x+a)/b^2-1/4*arcsin(b*x+a)^3/b^2-1/2*a^2*arcsin(b*x+a)^3/b^2+1/2*x^2*arcsin
(b*x+a)^3+6*a*(1-(b*x+a)^2)^(1/2)/b^2-3/8*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^2-3
*a*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^2+3/4*(b*x+a)*arcsin(b*x+a)^2*(1-(
b*x+a)^2)^(1/2)/b^2
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules

used = {4889, 4827, 4857, 3398, 3377, 2718, 3392, 30, 2715, 8}

$$\int x \arcsin(a+bx)^3 \, dx = -\frac{a^2 \arcsin(a+bx)^3}{2b^2} - \frac{\arcsin(a+bx)^3}{4b^2} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} - \frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} + \frac{6a(a+bx)\arcsin(a+bx)}{b^2} + \frac{3\arcsin(a+bx)}{8b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3 - \frac{3(a+bx)\sqrt{1-(a+bx)^2}}{8b^2} + \frac{6a\sqrt{1-(a+bx)^2}}{b^2}$$

```
[In] Int[x*ArcSin[a + b*x]^3,x]
```

```
[Out] (6*a*Sqrt[1 - (a + b*x)^2])/b^2 - (3*(a + b*x)*Sqrt[1 - (a + b*x)^2])/(8*b^
2) + (3*ArcSin[a + b*x])/(8*b^2) + (6*a*(a + b*x)*ArcSin[a + b*x])/b^2 - (3
*(a + b*x)^2*ArcSin[a + b*x])/(4*b^2) - (3*a*Sqrt[1 - (a + b*x)^2]*ArcSin[a
 + b*x]^2)/b^2 + (3*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(4*b
^2) - ArcSin[a + b*x]^3/(4*b^2) - (a^2*ArcSin[a + b*x]^3)/(2*b^2) + (x^2*Ar
cSin[a + b*x]^3)/2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)\arcsin(x)^3\,dx, x, a+bx\right)}{b}$$

$$= \frac{1}{2}x^2 \arcsin(a+bx)^3 - \frac{3}{2}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2 \arcsin(x)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)$$

$$= \frac{1}{2}x^2 \arcsin(a+bx)^3 - \frac{3}{2}\text{Subst}\left(\int x^2\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2\,dx, x, \arcsin(a+bx)\right)$$

$$= \frac{1}{2}x^2 \arcsin(a+bx)^3 - \frac{3}{2}\text{Subst}\left(\int \left(\frac{a^2x^2}{b^2}-\frac{2ax^2\sin(x)}{b^2}+\frac{x^2\sin^2(x)}{b^2}\right)\,dx, x, \arcsin(a+bx)\right)$$

$$= -\frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3 - \frac{3\text{Subst}\left(\int x^2\sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{2b^2} + \frac{(3a)\text{Subst}\left(\int x^2\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= -\frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} - \frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3 - \frac{3\text{Subst}\left(\int x^2\,dx, x, \arcsin(a+bx)\right)}{4b^2} + \frac{3\text{Subst}\left(\int \sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{4b^2} + \frac{(6a)\text{Subst}(\int x\cos(x)\,dx, x, \arcsin(a+bx))}{b^2}$$

$$= -\frac{3(a+bx)\sqrt{1-(a+bx)^2}}{8b^2} + \frac{6a(a+bx)\arcsin(a+bx)}{b^2} - \frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} - \frac{\arcsin(a+bx)^3}{4b^2} - \frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3 + \frac{3\text{Subst}(\int 1\,dx, x, \arcsin(a+bx))}{8b^2} - \frac{(6a)\text{Subst}(\int \sin(x)\,dx, x, \arcsin(a+bx))}{b^2}$$

$$= \frac{6a\sqrt{1-(a+bx)^2}}{b^2} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}}{8b^2} + \frac{3\arcsin(a+bx)}{8b^2} + \frac{6a(a+bx)\arcsin(a+bx)}{b^2} - \frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} - \frac{\arcsin(a+bx)^3}{4b^2} - \frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.64

$$\int x \arcsin(a+bx)^3\,dx$$
$$= \frac{3(15a-bx)\sqrt{1-a^2-2abx-b^2x^2}+(3+42a^2+36abx-6b^2x^2)\arcsin(a+bx)-6(3a-bx)\sqrt{1-a^2-}}{8b^2}$$

```
[In] Integrate[x*ArcSin[a + b*x]^3,x]
```

```
[Out] (3*(15*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + (3 + 42*a^2 + 36*a*b*x
- 6*b^2*x^2)*ArcSin[a + b*x] - 6*(3*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x
^2]*ArcSin[a + b*x]^2 + (-2 - 4*a^2 + 4*b^2*x^2)*ArcSin[a + b*x]^3)/(8*b^2)
```

Maple [A] (verified)

Time = 0.44 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.88

method	result
derivativedivides	$\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^3}{2}+\frac{3\arcsin(bx+a)^2\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{4}-\frac{3\left(-1+(bx+a)^2\right)\arcsin(bx+a)}{4}-\frac{3(bx+a)\sqrt{}}{}}{}$
default	$\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^3}{2}+\frac{3\arcsin(bx+a)^2\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{4}-\frac{3\left(-1+(bx+a)^2\right)\arcsin(bx+a)}{4}-\frac{3(bx+a)\sqrt{}}{}}{}$

```
[In] int(x*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^2*(1/2*(-1+(b*x+a)^2)*arcsin(b*x+a)^3+3/4*arcsin(b*x+a)^2*((b*x+a)*(1-(
b*x+a)^2)^(1/2)+arcsin(b*x+a))-3/4*(-1+(b*x+a)^2)*arcsin(b*x+a)-3/8*(b*x+a)
*(1-(b*x+a)^2)^(1/2)-3/8*arcsin(b*x+a)-1/2*arcsin(b*x+a)^3-a*(arcsin(b*x+a)
^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-6*(1-(b*x+a)^2)^(1/2)-6*ar
csin(b*x+a)*(b*x+a)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.51

$$\int x \arcsin(a+bx)^3\,dx$$
$$= \frac{2\left(2b^2x^2-2a^2-1\right)\arcsin\left(bx+a\right)^3-3\left(2b^2x^2-12abx-14a^2-1\right)\arcsin\left(bx+a\right)+3\sqrt{-b^2x^2-2abx}}{8b^2}$$

```
[In] integrate(x*arcsin(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a)^3 - 3*(2*b^2*x^2 - 12*a*b*x
- 14*a^2 - 1)*arcsin(b*x + a) + 3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(b*
x - 3*a)*arcsin(b*x + a)^2 - b*x + 15*a))/b^2
```

Sympy [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.18

$$\int x\arcsin(a+bx)^3\,dx$$
$$=\begin{cases} -\frac{a^2\operatorname{asin}^3(a+bx)}{2b^2}+\frac{21a^2\operatorname{asin}(a+bx)}{4b^2}+\frac{9ax\operatorname{asin}(a+bx)}{2b}-\frac{9a\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{4b^2}+\frac{45a\sqrt{-a^2-2abx-b^2x^2+1}}{8b^2}+\frac{x^2\operatorname{asi}}{} \\ \frac{x^2\operatorname{asin}^3(a)}{2} \end{cases}$$

```
[In] integrate(x*asin(b*x+a)**3,x)
```

```
[Out] Piecewise((-a**2*asin(a + b*x)**3/(2*b**2) + 21*a**2*asin(a + b*x)/(4*b**2)
 + 9*a*x*asin(a + b*x)/(2*b) - 9*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*as
in(a + b*x)**2/(4*b**2) + 45*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(8*b**
2) + x**2*asin(a + b*x)**3/2 - 3*x**2*asin(a + b*x)/4 + 3*x*sqrt(-a**2 - 2*
a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(4*b) - 3*x*sqrt(-a**2 - 2*a*b*x -
b**2*x**2 + 1)/(8*b) - asin(a + b*x)**3/(4*b**2) + 3*asin(a + b*x)/(8*b**2)
, Ne(b, 0)), (x**2*asin(a)**3/2, True))
```

Maxima [F]

$$\int x\arcsin(a+bx)^3\,dx=\int x\arcsin(bx+a)^3\,dx$$

```
[In] integrate(x*arcsin(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + 3*b*inte
grate(1/2*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2*arctan2(b*x + a, sqrt(b*
x + a + 1)*sqrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.96

$$\int x \arcsin(a+bx)^3 \, dx = -\frac{(bx+a)a \arcsin(bx+a)^3}{b^2} + \frac{\left((bx+a)^2-1\right) \arcsin(bx+a)^3}{2\,b^2} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a) \arcsin(bx+a)^2}{4\,b^2} - \frac{3\sqrt{-(bx+a)^2+1}a \arcsin(bx+a)^2}{b^2} + \frac{6\,(bx+a)a \arcsin(bx+a)}{b^2} + \frac{\arcsin(bx+a)^3}{4\,b^2} - \frac{3\left((bx+a)^2-1\right) \arcsin(bx+a)}{4\,b^2} - \frac{3\sqrt{-(bx+a)^2+1}(bx+a)}{8\,b^2} + \frac{6\sqrt{-(bx+a)^2+1}a}{b^2} - \frac{3 \arcsin(bx+a)}{8\,b^2}$$

```
[In] integrate(x*arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] -(b*x + a)*a*arcsin(b*x + a)^3/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)^
3/b^2 + 3/4*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b^2 - 3*sqrt
(-(b*x + a)^2 + 1)*a*arcsin(b*x + a)^2/b^2 + 6*(b*x + a)*a*arcsin(b*x + a)/
b^2 + 1/4*arcsin(b*x + a)^3/b^2 - 3/4*((b*x + a)^2 - 1)*arcsin(b*x + a)/b^2
 - 3/8*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^2 + 6*sqrt(-(b*x + a)^2 + 1)*a/b^
2 - 3/8*arcsin(b*x + a)/b^2
```

Mupad [F(-1)]

Timed out.

$$\int x \arcsin(a+bx)^3 \, dx = \int x \operatorname{asin}(a+b\,x)^3 \, dx$$

```
[In] int(x*asin(a + b*x)^3,x)
```

```
[Out] int(x*asin(a + b*x)^3, x)
```

3.140 $\int \arcsin(a+bx)^3\,dx$

Optimal result

Integrand size = 8, antiderivative size = 82

$$\int \arcsin(a+bx)^3\,dx = -\frac{6\sqrt{1-(a+bx)^2}}{b} - \frac{6(a+bx)\arcsin(a+bx)}{b} + \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b}$$

```
[Out] -6*(b*x+a)*arcsin(b*x+a)/b+(b*x+a)*arcsin(b*x+a)^3/b-6*(1-(b*x+a)^2)^(1/2)/
b+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4715, 4767, 267}

$$\int \arcsin(a+bx)^3\,dx = \frac{(a+bx)\arcsin(a+bx)^3}{b} + \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b} - \frac{6(a+bx)\arcsin(a+bx)}{b} - \frac{6\sqrt{1-(a+bx)^2}}{b}$$

```
[In] Int[ArcSin[a + b*x]^3,x]
```

```
[Out] (-6*Sqrt[1 - (a + b*x)^2])/b - (6*(a + b*x)*ArcSin[a + b*x])/b + (3*Sqrt[1
- (a + b*x)^2]*ArcSin[a + b*x]^2)/b + ((a + b*x)*ArcSin[a + b*x]^3)/b
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \arcsin(x)^3\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)\arcsin(a+bx)^3}{b} - \frac{3\text{Subst}\left(\int \frac{x\arcsin(x)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\
&= \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b}\\
&\quad - \frac{6\text{Subst}\left(\int \arcsin(x)\,dx, x, a+bx\right)}{b}\\
&= -\frac{6(a+bx)\arcsin(a+bx)}{b} + \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b}\\
&\quad + \frac{(a+bx)\arcsin(a+bx)^3}{b} + \frac{6\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\
&= -\frac{6\sqrt{1-(a+bx)^2}}{b} - \frac{6(a+bx)\arcsin(a+bx)}{b}\\
&\quad + \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.90

$$\int \arcsin(a+bx)^3\,dx$$
$$= \frac{-6\sqrt{1-(a+bx)^2}-6(a+bx)\arcsin(a+bx)+3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2+(a+bx)\arcsin(a+bx}{b}$$

```
[In] Integrate[ArcSin[a + b*x]^3,x]
```

```
[Out] (-6*Sqrt[1 - (a + b*x)^2] - 6*(a + b*x)*ArcSin[a + b*x] + 3*Sqrt[1 - (a + b
*x)^2]*ArcSin[a + b*x]^2 + (a + b*x)*ArcSin[a + b*x]^3)/b
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.87

method	result	size
derivativedivides	$\frac{\arcsin(bx+a)^3(bx+a)+3\arcsin(bx+a)^2\sqrt{1-(bx+a)^2}-6\sqrt{1-(bx+a)^2}-6\arcsin(bx+a)(bx+a)}{b}$	71
default	$\frac{\arcsin(bx+a)^3(bx+a)+3\arcsin(bx+a)^2\sqrt{1-(bx+a)^2}-6\sqrt{1-(bx+a)^2}-6\arcsin(bx+a)(bx+a)}{b}$	71

```
[In] int(arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b*(arcsin(b*x+a)^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-6*(1-(b*
x+a)^2)^(1/2)-6*arcsin(b*x+a)*(b*x+a))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.80

$$\int \arcsin(a+bx)^3\,dx$$
$$= \frac{(bx+a)\arcsin(bx+a)^3-6(bx+a)\arcsin(bx+a)+3\sqrt{-b^2x^2-2abx-a^2+1}\left(\arcsin(bx+a)^2-2\right)}{b}$$

```
[In] integrate(arcsin(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] ((b*x + a)*arcsin(b*x + a)^3 - 6*(b*x + a)*arcsin(b*x + a) + 3*sqrt(-b^2*x^
2 - 2*a*b*x - a^2 + 1)*(arcsin(b*x + a)^2 - 2))/b
```

Sympy [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.33

$$\int \arcsin(a+bx)^3\,dx$$
$$= \begin{cases} \frac{a\operatorname{asin}^3(a+bx)}{b} - \frac{6a\operatorname{asin}(a+bx)}{b} + x\operatorname{asin}^3(a+bx) - 6x\operatorname{asin}(a+bx) + \frac{3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{b} - \frac{6\sqrt{-a^2-2a}}{} \\ x\operatorname{asin}^3(a) \end{cases}$$

```
[In] integrate(asin(b*x+a)**3,x)
```

```
[Out] Piecewise((a*asin(a + b*x)**3/b - 6*a*asin(a + b*x)/b + x*asin(a + b*x)**3
- 6*x*asin(a + b*x) + 3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)
**2/b - 6*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/b, Ne(b, 0)), (x*asin(a)**3
, True))
```

Maxima [F]

$$\int \arcsin(a+bx)^3\,dx = \int \arcsin(bx+a)^3\,dx$$

```
[In] integrate(arcsin(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + 3*b*integrate(
sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x*arctan2(b*x + a, sqrt(b*x + a + 1)*s
qrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.95

$$\int \arcsin(a+bx)^3\,dx = \frac{(bx+a)\arcsin(bx+a)^3}{b} + \frac{3\sqrt{-(bx+a)^2+1}\arcsin(bx+a)^2}{b} - \frac{6(bx+a)\arcsin(bx+a)}{b} - \frac{6\sqrt{-(bx+a)^2+1}}{b}$$

```
[In] integrate(arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] (b*x + a)*arcsin(b*x + a)^3/b + 3*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)^2/
b - 6*(b*x + a)*arcsin(b*x + a)/b - 6*sqrt(-(b*x + a)^2 + 1)/b
```

Mupad [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.72

$$\int \arcsin(a+bx)^3\,dx=\frac{\left(3\,\mathrm{asin}(a+b\,x)^2-6\right)\,\sqrt{1-(a+b\,x)^2}}{b}-\frac{\left(6\,\mathrm{asin}(a+b\,x)-\mathrm{asin}(a+b\,x)^3\right)\,(a+b\,x)}{b}$$

[In] int(asin(a + b*x)^3,x)

[Out] ((3*asin(a + b*x)^2 - 6)*(1 - (a + b*x)^2)^(1/2))/b - ((6*asin(a + b*x) - a
sin(a + b*x)^3)*(a + b*x))/b

3.141 $\int \frac{\arcsin(a+bx)^3}{x}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 365

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x}\,dx = & -\frac{1}{4}i\arcsin(a+bx)^4+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & +\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & -3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & -3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & +6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & +6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & +6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\end{aligned}$$

```
[Out] -1/4*I*arcsin(b*x+a)^4+arcsin(b*x+a)^3*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
/(I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)^3*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
/(I*a+(-a^2+1)^(1/2)))-3*I*arcsin(b*x+a)^2*polylog(2,(I*(b*x+a)+(1-(b*x+a)^
2)^(1/2))/(I*a-(-a^2+1)^(1/2)))-3*I*arcsin(b*x+a)^2*polylog(2,(I*(b*x+a)+(1
-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+6*arcsin(b*x+a)*polylog(3,(I*(b*x+
a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+6*arcsin(b*x+a)*polylog(3,(I*
(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+6*I*polylog(4,(I*(b*x+a)
+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+6*I*polylog(4,(I*(b*x+a)+(1-(b*
x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4889, 4825, 4617, 2221, 2611, 6744, 2320, 6724}

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x}\,dx = &-3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ &-3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ &+6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ &+6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ &+6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ &+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)\\ &+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-\frac{1}{4}i\arcsin(a+bx)^4\end{aligned}$$

```
[In] Int[ArcSin[a + b*x]^3/x,x]
```

```
[Out] (-1/4*I)*ArcSin[a + b*x]^4 + ArcSin[a + b*x]^3*Log[1 - E^(I*ArcSin[a + b*x]
)/(I*a - Sqrt[1 - a^2])] + ArcSin[a + b*x]^3*Log[1 - E^(I*ArcSin[a + b*x])/
(I*a + Sqrt[1 - a^2])] - (3*I)*ArcSin[a + b*x]^2*PolyLog[2, E^(I*ArcSin[a +
 b*x])/(I*a - Sqrt[1 - a^2])] - (3*I)*ArcSin[a + b*x]^2*PolyLog[2, E^(I*Arc
Sin[a + b*x])/(I*a + Sqrt[1 - a^2])] + 6*ArcSin[a + b*x]*PolyLog[3, E^(I*Ar
cSin[a + b*x])/(I*a - Sqrt[1 - a^2])] + 6*ArcSin[a + b*x]*PolyLog[3, E^(I*A
rcSin[a + b*x])/(I*a + Sqrt[1 - a^2])] + (6*I)*PolyLog[4, E^(I*ArcSin[a + b
*x])/(I*a - Sqrt[1 - a^2])] + (6*I)*PolyLog[4, E^(I*ArcSin[a + b*x])/(I*a +
 Sqrt[1 - a^2])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\text{integral}=\frac{\text{Subst}\left(\int \frac{\arcsin(x)^3}{-\frac{a}{b}+\frac{x}{b}}\,dx,x,a+bx\right)}{b}$$

$$=\frac{\text{Subst}\left(\int \frac{x^3\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx,x,\arcsin(a+bx)\right)}{b}$$

$$=-\frac{1}{4}i\arcsin(a+bx)^4+\frac{i\text{Subst}\left(\int \frac{e^{ix}x^3}{-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx,x,\arcsin(a+bx)\right)}{b}+\frac{i\text{Subst}\left(\int \frac{e^{ix}x^3}{-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}+\frac{e^{ix}}{b}}\,dx,x,\arcsin(a+bx)\right)}{b}$$

$$=-\frac{1}{4}i\arcsin(a+bx)^4+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-3\text{Subst}\left(\int x^2\log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)-3\text{Subst}\left(\int x^2\log\left(1+\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)$$

$$=-\frac{1}{4}i\arcsin(a+bx)^4+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-3i\arcsin(a+bx)^2\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-3i\arcsin(a+bx)^2\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)+6i\text{Subst}\left(\int x\,\text{PolyLog}\left(2,-\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)+6i\text{Subst}\left(\int x\,\text{PolyLog}\left(2,-\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)$$

$$= -\frac{1}{4}i\arcsin(a+bx)^4 + \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$- 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$- 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$+ 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$- 6\text{Subst}\left(\int\operatorname{PolyLog}\left(3,-\frac{e^{ix}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)$$
$$- 6\text{Subst}\left(\int\operatorname{PolyLog}\left(3,-\frac{e^{ix}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)$$

$$= -\frac{1}{4}i\arcsin(a+bx)^4 + \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$- 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$- 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$+ 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)$$
$$+ 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$
$$+ 6i\text{Subst}\left(\int\frac{\operatorname{PolyLog}\left(3,\frac{x}{ia-\sqrt{1-a^2}}\right)}{x}dx,x,e^{i\arcsin(a+bx)}\right)$$
$$+ 6i\text{Subst}\left(\int\frac{\operatorname{PolyLog}\left(3,\frac{x}{ia+\sqrt{1-a^2}}\right)}{x}dx,x,e^{i\arcsin(a+bx)}\right)$$

$$= -\frac{1}{4}i\arcsin(a+bx)^4 + \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) + 6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.16

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = -\frac{1}{4}i\arcsin(a+bx)^4 + \arcsin(a+bx)^3\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) + \arcsin(a+bx)^3\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) + 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) + 6\arcsin(a+bx)\operatorname{PolyLog}\left(3,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) + 6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

```
[In] Integrate[ArcSin[a + b*x]^3/x,x]
```

```
[Out] (-1/4*I)*ArcSin[a + b*x]^4 + ArcSin[a + b*x]^3*Log[1 + E^(I*ArcSin[a + b*x]
)/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]^3*Log[1 + E^(I*ArcS
in[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - (3*I)*ArcSin[a + b*x]^2*
PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))] - (
3*I)*ArcSin[a + b*x]^2*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b + Sq
rt[1 - a^2]/b)*b))] + 6*ArcSin[a + b*x]*PolyLog[3, -(E^(I*ArcSin[a + b*x])/
((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))] + 6*ArcSin[a + b*x]*PolyLog[3, -(E^(I*
ArcSin[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b))] + (6*I)*PolyLog[4, E^
(I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])] + (6*I)*PolyLog[4, E^(I*ArcSin[a
 + b*x])/(I*a + Sqrt[1 - a^2])]
```

Maple [F]

$$\int \frac{\arcsin{(bx+a)}^3}{x}dx$$

```
[In] int(arcsin(b*x+a)^3/x,x)
[Out] int(arcsin(b*x+a)^3/x,x)
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin{(bx+a)}^3}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/x,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)^3/x, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\operatorname{asin}^3{(a+bx)}}{x}\,dx$$

```
[In] integrate(asin(b*x+a)**3/x,x)
[Out] Integral(asin(a + b*x)**3/x, x)
```

Maxima [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/x,x, algorithm="maxima")
[Out] integrate(arcsin(b*x + a)^3/x, x)
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/x,x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)^3/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^3}{x}\,dx$$

```
[In] int(asin(a + b*x)^3/x,x)
[Out] int(asin(a + b*x)^3/x, x)
```

3.142 $\int \frac{\arcsin(a+bx)^3}{x^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 316

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = & -\frac{\arcsin(a+bx)^3}{x}+\frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\ & -\frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\ & +\frac{6b\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\ & -\frac{6b\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\ & +\frac{6ib\,\mathrm{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}-\frac{6ib\,\mathrm{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\end{aligned}$$

```
[Out] -arcsin(b*x+a)^3/x+3*I*b*arcsin(b*x+a)^2*ln(1+I*(I*(b*x+a)+(1-(b*x+a)^2)^(1
/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(1/2)-3*I*b*arcsin(b*x+a)^2*ln(1+I*(I*(b*x+
a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2-1)^(1/2)+6*b*arcsin(b*x+a)*
polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(1/
2)-6*b*arcsin(b*x+a)*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-1
)^(1/2)))/(a^2-1)^(1/2)+6*I*b*polylog(3,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/
(a-(a^2-1)^(1/2)))/(a^2-1)^(1/2)-6*I*b*polylog(3,-I*(I*(b*x+a)+(1-(b*x+a)^2
)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2-1)^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.750$, Rules used = {4889, 4827, 4857, 3404, 2296, 2221, 2611, 2320, 6724}

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} - \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} + \frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} - \frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} + \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}} - \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)}{\sqrt{a^2-1}} - \frac{\arcsin(a+bx)^3}{x}$$

```
[In] Int[ArcSin[a + b*x]^3/x^2,x]
```

```
[Out] -(ArcSin[a + b*x]^3/x) + ((3*I)*b*ArcSin[a + b*x]^2*Log[1 + (I*E^(I*ArcSin[
a + b*x]))/(a - Sqrt[-1 + a^2])])/Sqrt[-1 + a^2] - ((3*I)*b*ArcSin[a + b*x]
^2*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/Sqrt[-1 + a^2]
+ (6*b*ArcSin[a + b*x]*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1
 + a^2])])/Sqrt[-1 + a^2] - (6*b*ArcSin[a + b*x]*PolyLog[2, ((-I)*E^(I*ArcS
in[a + b*x]))/(a + Sqrt[-1 + a^2])])/Sqrt[-1 + a^2] + ((6*I)*b*PolyLog[3, (
(-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])])/Sqrt[-1 + a^2] - ((6*I)*
b*PolyLog[3, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/Sqrt[-1 +
a^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
```

```
2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3404

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Dist[2, Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x)
) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[
a^2 - b^2, 0] && IGtQ[m, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)^3}{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\arcsin(a+bx)^3}{x} + 3\text{Subst}\left(\int \frac{\arcsin(x)^2}{\left(-\frac{a}{b}+\frac{x}{b}\right)\sqrt{1-x^2}}\,dx, x, a+bx\right)\\
&= -\frac{\arcsin(a+bx)^3}{x} + 3\text{Subst}\left(\int \frac{x^2}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx, x, \arcsin(a+bx)\right)\\
&= -\frac{\arcsin(a+bx)^3}{x} + 6\text{Subst}\left(\int \frac{e^{ix}x^2}{\frac{i}{b}-\frac{2ae^{ix}}{b}-\frac{ie^{2ix}}{b}}\,dx, x, \arcsin(a+bx)\right)\\
&= -\frac{\arcsin(a+bx)^3}{x} - \frac{(6i)\text{Subst}\left(\int \frac{e^{ix}x^2}{-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}\\
&\quad + \frac{(6i)\text{Subst}\left(\int \frac{e^{ix}x^2}{-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}-\frac{2ie^{ix}}{b}}\,dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}\\
&= -\frac{\arcsin(a+bx)^3}{x} + \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\
&\quad - \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\
&\quad + \frac{(6ib)\text{Subst}\left(\int x\log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}\\
&\quad - \frac{(6ib)\text{Subst}\left(\int x\log\left(1-\frac{2ie^{ix}}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx, x, \arcsin(a+bx)\right)}{\sqrt{-1+a^2}}
\end{aligned}$$

$$= -\frac{\arcsin(a+bx)^3}{x} + \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{(6b)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{2ie^{ix}}{\left(-\frac{2a}{b}-\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)}{\sqrt{-1+a^2}} - \frac{(6b)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{2ie^{ix}}{\left(-\frac{2a}{b}+\frac{2\sqrt{-1+a^2}}{b}\right)b}\right)dx,x,\arcsin(a+bx)\right)}{\sqrt{-1+a^2}}$$

$$= -\frac{\arcsin(a+bx)^3}{x} + \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{(6ib)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{ix}{-a+\sqrt{-1+a^2}}\right)}{x}dx,x,e^{i\arcsin(a+bx)}\right)}{\sqrt{-1+a^2}} - \frac{(6ib)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,-\frac{ix}{a+\sqrt{-1+a^2}}\right)}{x}dx,x,e^{i\arcsin(a+bx)}\right)}{\sqrt{-1+a^2}}$$

$$= -\frac{\arcsin(a+bx)^3}{x} + \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} + \frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}} - \frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 309, normalized size of antiderivative = 0.98

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = -\frac{\sqrt{-1+a^2}\arcsin(a+bx)^3 - 3ibx\arcsin(a+bx)^2\log\left(\frac{a-\sqrt{-1+a^2}+ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right) + 3ibx\arcsin(a+bx)^2\log}{}$$

```
[In] Integrate[ArcSin[a + b*x]^3/x^2,x]
```

```
[Out] -((Sqrt[-1 + a^2]*ArcSin[a + b*x]^3 - (3*I)*b*x*ArcSin[a + b*x]^2*Log[(a -
Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])] + (3*I)*b*x
*ArcSin[a + b*x]^2*Log[(a + Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a +
Sqrt[-1 + a^2])] - 6*b*x*ArcSin[a + b*x]*PolyLog[2, (I*E^(I*ArcSin[a + b*x]
))/(-a + Sqrt[-1 + a^2])] + 6*b*x*ArcSin[a + b*x]*PolyLog[2, ((-I)*E^(I*Arc
Sin[a + b*x]))/(a + Sqrt[-1 + a^2])] - (6*I)*b*x*PolyLog[3, (I*E^(I*ArcSin[
a + b*x]))/(-a + Sqrt[-1 + a^2])] + (6*I)*b*x*PolyLog[3, ((-I)*E^(I*ArcSin[
a + b*x]))/(a + Sqrt[-1 + a^2])])/(Sqrt[-1 + a^2]*x))
```

Maple [F]

$$\int \frac{\arcsin(bx+a)^3}{x^2}\,dx$$

```
[In] int(arcsin(b*x+a)^3/x^2,x)
```

```
[Out] int(arcsin(b*x+a)^3/x^2,x)
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x^2}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/x^2,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)^3/x^2, x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\operatorname{asin}^3\left(a+bx\right)}{x^2}\,dx$$

```
[In] integrate(asin(b*x+a)**3/x**2,x)
[Out] Integral(asin(a + b*x)**3/x**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(arcsin(b*x+a)^3/x^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x^2}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/x^2,x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)^3/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^3}{x^2}\,dx$$

```
[In] int(asin(a + b*x)^3/x^2,x)
[Out] int(asin(a + b*x)^3/x^2, x)
```

3.143 $\int \frac{x^2}{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 60

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{4b^3} + \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{b^3} - \frac{\text{CosIntegral}(3\arcsin(a+bx))}{4b^3} - \frac{a\text{Si}(2\arcsin(a+bx))}{b^3}$$

```
[Out] 1/4*Ci(arcsin(b*x+a))/b^3+a^2*Ci(arcsin(b*x+a))/b^3-1/4*Ci(3*arcsin(b*x+a))
/b^3-a*Si(2*arcsin(b*x+a))/b^3
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4889, 4831, 6873, 12, 6874, 3383, 4491, 3380}

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{b^3} + \frac{\text{CosIntegral}(\arcsin(a+bx))}{4b^3} - \frac{\text{CosIntegral}(3\arcsin(a+bx))}{4b^3} - \frac{a\text{Si}(2\arcsin(a+bx))}{b^3}$$

```
[In] Int[x^2/ArcSin[a + b*x],x]
```

```
[Out] CosIntegral[ArcSin[a + b*x]]/(4*b^3) + (a^2*CosIntegral[ArcSin[a + b*x]])/b
^3 - CosIntegral[3*ArcSin[a + b*x]]/(4*b^3) - (a*SinIntegral[2*ArcSin[a + b
*x]])/b^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{\arcsin(x)}\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2}{x}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)(a-\sin(x))^2}{b^2 x}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)(a-\sin(x))^2}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{a^2\cos(x)}{x}-\frac{2a\cos(x)\sin(x)}{x}+\frac{\cos(x)\sin^2(x)}{x}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{(2a)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3} + \frac{a^2\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{b^3} + \frac{\text{Subst}\left(\int \left(\frac{\cos(x)}{4x}-\frac{\cos(3x)}{4x}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{(2a)\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{b^3} + \frac{\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{4b^3} - \frac{\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \arcsin(a+bx)\right)}{4b^3} - \frac{a\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{\text{CosIntegral}(\arcsin(a+bx))}{4b^3} + \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{b^3} - \frac{\text{CosIntegral}(3\arcsin(a+bx))}{4b^3} - \frac{a\text{Si}(2\arcsin(a+bx))}{b^3}$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.75

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = -\frac{-\left((1+4a^2)\,\text{CosIntegral}(\arcsin(a+bx))\right)+\text{CosIntegral}(3\arcsin(a+bx))+4a\text{Si}(2\arcsin(a+bx))}{4b^3}$$

```
[In] Integrate[x^2/ArcSin[a + b*x],x]
```

```
[Out] -1/4*(-((1 + 4*a^2)*CosIntegral[ArcSin[a + b*x]]) + CosIntegral[3*ArcSin[a
+ b*x]] + 4*a*SinIntegral[2*ArcSin[a + b*x]])/b^3
```

Maple [A] (verified)

Time = 0.59 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.82

method	result	size
derivativedivides	$\frac{\frac{\text{Ci}(\arcsin(bx+a))}{4}-\frac{\text{Ci}(3\arcsin(bx+a))}{4}-a\,\text{Si}(2\arcsin(bx+a))+a^2\,\text{Ci}(\arcsin(bx+a))}{b^3}$	49
default	$\frac{\frac{\text{Ci}(\arcsin(bx+a))}{4}-\frac{\text{Ci}(3\arcsin(bx+a))}{4}-a\,\text{Si}(2\arcsin(bx+a))+a^2\,\text{Ci}(\arcsin(bx+a))}{b^3}$	49

```
[In] int(x^2/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(1/4*Ci(arcsin(b*x+a))-1/4*Ci(3*arcsin(b*x+a))-a*Si(2*arcsin(b*x+a))+
a^2*Ci(arcsin(b*x+a)))
```

Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate(x^2/arcsin(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(x^2/arcsin(b*x + a), x)
```

Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\operatorname{asin}(a+bx)}\,dx$$

```
[In] integrate(x**2/asin(b*x+a),x)
[Out] Integral(x**2/asin(a + b*x), x)
```

Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\arcsin(bx+a)}\,dx$$

```
[In] integrate(x^2/arcsin(b*x+a),x, algorithm="maxima")
[Out] integrate(x^2/arcsin(b*x + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \frac{a^2\operatorname{Ci}(\arcsin(bx+a))}{b^3} - \frac{a\operatorname{Si}(2\arcsin(bx+a))}{b^3} - \frac{\operatorname{Ci}(3\arcsin(bx+a))}{4b^3} + \frac{\operatorname{Ci}(\arcsin(bx+a))}{4b^3}$$

```
[In] integrate(x^2/arcsin(b*x+a),x, algorithm="giac")
[Out] a^2*cos_integral(arcsin(b*x + a))/b^3 - a*sin_integral(2*arcsin(b*x + a))/b
^3 - 1/4*cos_integral(3*arcsin(b*x + a))/b^3 + 1/4*cos_integral(arcsin(b*x
+ a))/b^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\operatorname{asin}(a+b\,x)}\,dx$$

```
[In] int(x^2/asin(a + b*x),x)
[Out] int(x^2/asin(a + b*x), x)
```

3.144 $\int \frac{x}{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 30

$$\int \frac{x}{\arcsin(a+bx)}\,dx=-\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2}+\frac{\text{Si}(2\arcsin(a+bx))}{2b^2}$$

```
[Out] -a*Ci(arcsin(b*x+a))/b^2+1/2*Si(2*arcsin(b*x+a))/b^2
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {4889, 4831, 6873, 12, 6874, 3383, 4491, 3380}

$$\int \frac{x}{\arcsin(a+bx)}\,dx=\frac{\text{Si}(2\arcsin(a+bx))}{2b^2}-\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2}$$

```
[In] Int[x/ArcSin[a + b*x],x]
```

```
[Out] -((a*CosIntegral[ArcSin[a + b*x]])/b^2) + SinIntegral[2*ArcSin[a + b*x]]/(2
*b^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{-\frac{a}{b}+\frac{x}{b}}{\arcsin(x)}\,dx, x, a+bx\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{\cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{\cos(x)(-a+\sin(x))}{bx}\,dx, x, \arcsin(a+bx)\right)}{b}
\end{aligned}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)(-a+\sin(x))}{x}\,dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{\text{Subst}\left(\int \left(-\frac{a\cos(x)}{x}+\frac{\cos(x)\sin(x)}{x}\right)\,dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^2} - \frac{a\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b^2}$$

$$= -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

$$\int \frac{x}{\arcsin(a+bx)}\,dx = -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}$$

```
[In] Integrate[x/ArcSin[a + b*x],x]
[Out] -((a*CosIntegral[ArcSin[a + b*x]])/b^2) + SinIntegral[2*ArcSin[a + b*x]]/(2
*b^2)
```

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.90

method	result	size
derivativedivides	$\frac{\frac{\text{Si}(2\arcsin(bx+a))}{2}-a\,\text{Ci}(\arcsin(bx+a))}{b^2}$	27
default	$\frac{\frac{\text{Si}(2\arcsin(bx+a))}{2}-a\,\text{Ci}(\arcsin(bx+a))}{b^2}$	27

```
[In] int(x/arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] 1/b^2*(1/2*Si(2*arcsin(b*x+a))-a*Ci(arcsin(b*x+a)))
```

Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate(x/arcsin(b*x+a),x, algorithm="fricas")
[Out] integral(x/arcsin(b*x + a), x)
```

Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\operatorname{asin}\left(a+bx\right)}\,dx$$

```
[In] integrate(x/asin(b*x+a),x)
[Out] Integral(x/asin(a + b*x), x)
```

Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate(x/arcsin(b*x+a),x, algorithm="maxima")
[Out] integrate(x/arcsin(b*x + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

$$\int \frac{x}{\arcsin(a+bx)}\,dx = -\frac{a\operatorname{Ci}\left(\arcsin\left(bx+a\right)\right)}{b^2} + \frac{\operatorname{Si}\left(2\arcsin\left(bx+a\right)\right)}{2\,b^2}$$

```
[In] integrate(x/arcsin(b*x+a),x, algorithm="giac")
[Out] -a*cos_integral(arcsin(b*x + a))/b^2 + 1/2*sin_integral(2*arcsin(b*x + a))/
b^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\operatorname{asin}\left(a+b\,x\right)}\,dx$$

```
[In] int(x/asin(a + b*x),x)
[Out] int(x/asin(a + b*x), x)
```

3.145 $\int \frac{1}{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 8, antiderivative size = 11

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

```
[Out] Ci(arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4887, 4719, 3383}

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

```
[In] Int[ArcSin[a + b*x]^(-1),x]
```

```
[Out] CosIntegral[ArcSin[a + b*x]]/b
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\arcsin(x)}\,dx, x, a+bx\right)}{b}$$
$$= \frac{\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}$$
$$= \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

```
[In] Integrate[ArcSin[a + b*x]^(-1),x]
[Out] CosIntegral[ArcSin[a + b*x]]/b
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

method	result	size
derivativedivides	$\frac{\mathrm{Ci}(\arcsin(bx+a))}{b}$	12
default	$\frac{\mathrm{Ci}(\arcsin(bx+a))}{b}$	12

```
[In] int(1/arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] Ci(arcsin(b*x+a))/b
```

Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/arcsin(b*x+a),x, algorithm="fricas")
[Out] integral(1/arcsin(b*x + a), x)
```

Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\operatorname{asin}(a+bx)}\,dx$$

```
[In] integrate(1/asin(b*x+a),x)
[Out] Integral(1/asin(a + b*x), x)
```

Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/arcsin(b*x+a),x, algorithm="maxima")
[Out] integrate(1/arcsin(b*x + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \frac{\operatorname{Ci}(\arcsin(bx+a))}{b}$$

```
[In] integrate(1/arcsin(b*x+a),x, algorithm="giac")
[Out] cos_integral(arcsin(b*x + a))/b
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

```
[In] int(1/asin(a + b*x),x)
[Out] int(1/asin(a + b*x), x)
```

3.146 $\int \frac{1}{x \arcsin(a+bx)} \, dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)} \, dx = \operatorname{Int}\left(\frac{1}{x \arcsin(a+bx)}, x\right)$$

```
[Out] Unintegrable(1/x/arcsin(b*x+a),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x \arcsin(a+bx)} \, dx = \int \frac{1}{x \arcsin(a+bx)} \, dx$$

```
[In] Int[1/(x*ArcSin[a + b*x]),x]
[Out] Defer[Subst][Defer[Int][1/((-(a/b) + x/b)*ArcSin[x]), x], x, a + b*x]/b
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right) \arcsin(x)} \, dx, x, a+bx\right)}{b}$$

Mathematica [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx=\int \frac{1}{x \arcsin(a+bx)}\,dx$$

```
[In] Integrate[1/(x*ArcSin[a + b*x]),x]
[Out] Integrate[1/(x*ArcSin[a + b*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 6.88 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin\left(bx+a\right)}dx$$

```
[In] int(1/x/arcsin(b*x+a),x)
[Out] int(1/x/arcsin(b*x+a),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx=\int \frac{1}{x \arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate(1/x/arcsin(b*x+a),x, algorithm="fricas")
[Out] integral(1/(x*arcsin(b*x + a)), x)
```

Sympy [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{1}{x \arcsin(a+bx)}\,dx=\int \frac{1}{x \operatorname{asin}\left(a+bx\right)}\,dx$$

```
[In] integrate(1/x/asin(b*x+a),x)
[Out] Integral(1/(x*asin(a + b*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \arcsin(bx+a)}\,dx$$

```
[In] integrate(1/x/arcsin(b*x+a),x, algorithm="maxima")
[Out] integrate(1/(x*arcsin(b*x + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \arcsin(bx+a)}\,dx$$

```
[In] integrate(1/x/arcsin(b*x+a),x, algorithm="giac")
[Out] integrate(1/(x*arcsin(b*x + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \operatorname{asin}(a+b\,x)}\,dx$$

```
[In] int(1/(x*asin(a + b*x)),x)
[Out] int(1/(x*asin(a + b*x)), x)
```

3.147 $\int \frac{x^2}{\arcsin(a+bx)^2} \, dx$

Optimal result

Integrand size = 12, antiderivative size = 84

$$\int \frac{x^2}{\arcsin(a+bx)^2} \, dx = -\frac{x^2\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{2a\,\text{CosIntegral}(2\arcsin(a+bx))}{b^3} - \frac{(1+4a^2)\,\text{Si}(\arcsin(a+bx))}{4b^3} + \frac{3\text{Si}(3\arcsin(a+bx))}{4b^3}$$

```
[Out] -2*a*Ci(2*arcsin(b*x+a))/b^3-1/4*(4*a^2+1)*Si(arcsin(b*x+a))/b^3+3/4*Si(3*a
rcsin(b*x+a))/b^3-x^2*(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.92, number of steps used = 12, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4889, 4829, 4717, 4809, 3380, 4727, 3383}

$$\int \frac{x^2}{\arcsin(a+bx)^2} \, dx = -\frac{a^2\text{Si}(\arcsin(a+bx))}{b^3} - \frac{a^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{2a\,\text{CosIntegral}(2\arcsin(a+bx))}{b^3} - \frac{\text{Si}(\arcsin(a+bx))}{4b^3} + \frac{3\text{Si}(3\arcsin(a+bx))}{4b^3} + \frac{2a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)}$$

```
[In] Int[x^2/ArcSin[a + b*x]^2,x]
```

```
[Out] -((a^2*Sqrt[1 - (a + b*x)^2])/(b^3*ArcSin[a + b*x])) + (2*a*(a + b*x)*Sqrt[
1 - (a + b*x)^2])/(b^3*ArcSin[a + b*x]) - ((a + b*x)^2*Sqrt[1 - (a + b*x)^2
```

```
])/(b^3*ArcSin[a + b*x]) - (2*a*CosIntegral[2*ArcSin[a + b*x]])/b^3 - SinIn
tegral[ArcSin[a + b*x]]/(4*b^3) - (a^2*SinIntegral[ArcSin[a + b*x]])/b^3 +
(3*SinIntegral[3*ArcSin[a + b*x]])/(4*b^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{a^2}{b^2\arcsin(x)^2} - \frac{2ax}{b^2\arcsin(x)^2} + \frac{x^2}{b^2\arcsin(x)^2}\right)\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{x^2}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3} - \frac{(2a)\text{Subst}\left(\int \frac{x}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3} + \frac{a^2\text{Subst}\left(\int \frac{1}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} + \frac{2a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} + \frac{\text{Subst}\left(\int \left(-\frac{\sin(x)}{4x} + \frac{3\sin(3x)}{4x}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{(2a)\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{a^2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)}\,dx, x, a+bx\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} + \frac{2a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{2a\,\text{CosIntegral}(2\arcsin(a+bx))}{b^3} - \frac{\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{4b^3} + \frac{3\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \arcsin(a+bx)\right)}{4b^3} - \frac{a^2\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} + \frac{2a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)} - \frac{2a\,\text{CosIntegral}(2\arcsin(a+bx))}{b^3} - \frac{\text{Si}(\arcsin(a+bx))}{4b^3} - \frac{a^2\text{Si}(\arcsin(a+bx))}{b^3} + \frac{3\text{Si}(3\arcsin(a+bx))}{4b^3}$$

Mathematica [A] (verified)

Time = 2.24 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.02

$$\int \frac{x^2}{\arcsin(a+bx)^2} dx = -\frac{\frac{4b^2x^2\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)} + 8a\,\text{CosIntegral}(2\arcsin(a+bx)) + (1+4a^2)\,\text{Si}(\arcsin(a+bx)) - 3\text{Si}(3\arcsin(a}{4b^3}$$

[In] Integrate[x^2/ArcSin[a + b*x]^2,x]

[Out] -1/4*((4*b^2*x^2*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/ArcSin[a + b*x] + 8*a*CosIntegral[2*ArcSin[a + b*x]] + (1 + 4*a^2)*SinIntegral[ArcSin[a + b*x]] - 3*SinIntegral[3*ArcSin[a + b*x]])/b^3

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.77

method	result
derivativedivides	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{4\arcsin(bx+a)} - \frac{\text{Si}(\arcsin(bx+a))}{4} + \frac{\cos(3\arcsin(bx+a))}{4\arcsin(bx+a)} + \frac{3\ \text{Si}(3\arcsin(bx+a))}{4} - \frac{a(2\ \text{Ci}(2\arcsin(bx+a))\arcsin(bx+a) - \sin(2\arcsin}{\arcsin(bx+a)}}{b^3}$
default	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{4\arcsin(bx+a)} - \frac{\text{Si}(\arcsin(bx+a))}{4} + \frac{\cos(3\arcsin(bx+a))}{4\arcsin(bx+a)} + \frac{3\ \text{Si}(3\arcsin(bx+a))}{4} - \frac{a(2\ \text{Ci}(2\arcsin(bx+a))\arcsin(bx+a) - \sin(2\arcsin}{\arcsin(bx+a)}}{b^3}$

[In] int(x^2/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)

[Out] 1/b^3*(-1/4/arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)-1/4*Si(arcsin(b*x+a))+1/4/arcsin(b*x+a)*cos(3*arcsin(b*x+a))+3/4*Si(3*arcsin(b*x+a))-a*(2*Ci(2*arcsin(b*x+a))*arcsin(b*x+a)-sin(2*arcsin(b*x+a)))/arcsin(b*x+a)-a^2*(Si(arcsin(b*x+a))*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a))

Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2} dx = \int \frac{x^2}{\arcsin(bx+a)^2} dx$$

[In] integrate(x^2/arcsin(b*x+a)^2,x, algorithm="fricas")

[Out] integral(x^2/arcsin(b*x + a)^2, x)

Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

```
[In] integrate(x**2/asin(b*x+a)**2,x)
[Out] Integral(x**2/asin(a + b*x)**2, x)
```

Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(x^2/arcsin(b*x+a)^2,x, algorithm="maxima")
[Out] -(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2 - b*arctan2(b*x + a, sqrt(b*x +
a + 1)*sqrt(-b*x - a + 1))*integrate((3*b^2*x^3 + 5*a*b*x^2 + 2*(a^2 - 1)*x
)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^2 + 2*a*b^2*x + (a^2 - 1)*b)
*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))), x))/(b*arctan2(b*
x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 169 vs. 2(78) = 156.

Time = 0.31 (sec) , antiderivative size = 169, normalized size of antiderivative = 2.01

$$\begin{aligned}\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = &-\frac{a^2\,\mathrm{Si}\left(\arcsin\left(bx+a\right)\right)}{b^3} - \frac{2\,a\,\mathrm{Ci}\left(2\,\arcsin\left(bx+a\right)\right)}{b^3} \\ &+ \frac{2\sqrt{-(bx+a)^2+1}(bx+a)a}{b^3\arcsin\left(bx+a\right)} - \frac{\sqrt{-(bx+a)^2+1}a^2}{b^3\arcsin\left(bx+a\right)} \\ &+ \frac{3\,\mathrm{Si}\left(3\,\arcsin\left(bx+a\right)\right)}{4\,b^3} - \frac{\mathrm{Si}\left(\arcsin\left(bx+a\right)\right)}{4\,b^3} \\ &+ \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{b^3\arcsin\left(bx+a\right)} - \frac{\sqrt{-(bx+a)^2+1}}{b^3\arcsin\left(bx+a\right)}\end{aligned}$$

```
[In] integrate(x^2/arcsin(b*x+a)^2,x, algorithm="giac")
[Out] -a^2*sin_integral(arcsin(b*x + a))/b^3 - 2*a*cos_integral(2*arcsin(b*x + a)
)/b^3 + 2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*a/(b^3*arcsin(b*x + a)) - sqrt(-
(b*x + a)^2 + 1)*a^2/(b^3*arcsin(b*x + a)) + 3/4*sin_integral(3*arcsin(b*x
+ a))/b^3 - 1/4*sin_integral(arcsin(b*x + a))/b^3 + (-(b*x + a)^2 + 1)^(3/2
)/(b^3*arcsin(b*x + a)) - sqrt(-(b*x + a)^2 + 1)/(b^3*arcsin(b*x + a))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx=\int \frac{x^2}{{\mathrm{asin}\left(a+b\,x\right)}^2} \,d x$$

```
[In] int(x^2/asin(a + b*x)^2,x)
```

```
[Out] int(x^2/asin(a + b*x)^2, x)
```

3.148 $\int \frac{x}{\arcsin(a+bx)^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 55

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = -\frac{x\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} + \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b^2} + \frac{a\text{Si}(\arcsin(a+bx))}{b^2}$$

```
[Out] Ci(2*arcsin(b*x+a))/b^2+a*Si(arcsin(b*x+a))/b^2-x*(1-(b*x+a)^2)^(1/2)/b/arc
sin(b*x+a)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.58, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.700$, Rules used = {4889, 4829, 4717, 4809, 3380, 4727, 3383}

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b^2} + \frac{a\text{Si}(\arcsin(a+bx))}{b^2} + \frac{a\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)}$$

```
[In] Int[x/ArcSin[a + b*x]^2,x]
```

```
[Out] (a*Sqrt[1 - (a + b*x)^2])/(b^2*ArcSin[a + b*x]) - ((a + b*x)*Sqrt[1 - (a +
b*x)^2])/(b^2*ArcSin[a + b*x]) + CosIntegral[2*ArcSin[a + b*x]]/b^2 + (a*Si
nIntegral[ArcSin[a + b*x]])/b^2
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{-\frac{a}{b}+\frac{x}{b}}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\arcsin(x)^2}+\frac{x}{b\arcsin(x)^2}\right)\,dx, x, a+bx\right)}{b}$$
$$= \frac{\text{Subst}\left(\int \frac{x}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b^2} - \frac{a\text{Subst}\left(\int \frac{1}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b^2}$$
$$= \frac{a\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^2} + \frac{a\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)}\,dx, x, a+bx\right)}{b^2}$$
$$= \frac{a\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} + \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b^2} + \frac{a\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^2}$$
$$= \frac{a\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b^2\arcsin(a+bx)} + \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b^2} + \frac{a\text{Si}(\arcsin(a+bx))}{b^2}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.15

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \frac{-bx\sqrt{1-(a+bx)^2}+\arcsin(a+bx)\,\text{CosIntegral}(2\arcsin(a+bx))+a\arcsin(a+bx)\text{Si}(\arcsin(a+bx))}{b^2\arcsin(a+bx)}$$

```
[In] Integrate[x/ArcSin[a + b*x]^2,x]
[Out] (-(b*x*Sqrt[1 - (a + b*x)^2]) + ArcSin[a + b*x]*CosIntegral[2*ArcSin[a + b*
x]] + a*ArcSin[a + b*x]*SinIntegral[ArcSin[a + b*x]])/(b^2*ArcSin[a + b*x])
```

Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.31

method	result	size
derivativedivides	$\frac{-\frac{\sin(2\arcsin(bx+a))}{2\arcsin(bx+a)}+\mathrm{Ci}(2\arcsin(bx+a))+\frac{a\left(\mathrm{Si}(\arcsin(bx+a))\arcsin(bx+a)+\sqrt{1-(bx+a)^2}\right)}{\arcsin(bx+a)}}{b^2}$	72
default	$\frac{-\frac{\sin(2\arcsin(bx+a))}{2\arcsin(bx+a)}+\mathrm{Ci}(2\arcsin(bx+a))+\frac{a\left(\mathrm{Si}(\arcsin(bx+a))\arcsin(bx+a)+\sqrt{1-(bx+a)^2}\right)}{\arcsin(bx+a)}}{b^2}$	72

```
[In] int(x/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] 1/b^2*(-1/2/arcsin(b*x+a)*sin(2*arcsin(b*x+a))+Ci(2*arcsin(b*x+a))+a*(Si(ar
csin(b*x+a))*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a))
```

Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(x/arcsin(b*x+a)^2,x, algorithm="fricas")
[Out] integral(x/arcsin(b*x + a)^2, x)
```

Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \int \frac{x}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

```
[In] integrate(x/asin(b*x+a)**2,x)
[Out] Integral(x/asin(a + b*x)**2, x)
```

Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(x/arcsin(b*x+a)^2,x, algorithm="maxima")
[Out] (b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate((2*b^2*
x^2 + 3*a*b*x + a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^2 + 2
*a*b^2*x + (a^2 - 1)*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a +
1))), x) - sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x)/(b*arctan2(b*x + a, sqrt
(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.51

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \frac{a\,\mathrm{Si}\left(\arcsin\left(bx+a\right)\right)}{b^2} + \frac{\mathrm{Ci}\left(2\,\arcsin\left(bx+a\right)\right)}{b^2} - \frac{\sqrt{-\left(bx+a\right)^2+1}(bx+a)}{b^2\arcsin\left(bx+a\right)} + \frac{\sqrt{-\left(bx+a\right)^2+1}a}{b^2\arcsin\left(bx+a\right)}$$

```
[In] integrate(x/arcsin(b*x+a)^2,x, algorithm="giac")
```

```
[Out] a*sin_integral(arcsin(b*x + a))/b^2 + cos_integral(2*arcsin(b*x + a))/b^2 -
 sqrt(-(b*x + a)^2 + 1)*(b*x + a)/(b^2*arcsin(b*x + a)) + sqrt(-(b*x + a)^2
 + 1)*a/(b^2*arcsin(b*x + a))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \int \frac{x}{\mathrm{asin}\left(a+b\,x\right)^2}\,dx$$

```
[In] int(x/asin(a + b*x)^2,x)
```

```
[Out] int(x/asin(a + b*x)^2, x)
```

3.149 $\int \frac{1}{\arcsin(a+bx)^2} dx$

Optimal result

Integrand size = 8, antiderivative size = 41

$$\int \frac{1}{\arcsin(a+bx)^2} dx = -\frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\mathrm{Si}(\arcsin(a+bx))}{b}$$

```
[Out] -Si(arcsin(b*x+a))/b-(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4717, 4809, 3380}

$$\int \frac{1}{\arcsin(a+bx)^2} dx = -\frac{\mathrm{Si}(\arcsin(a+bx))}{b} - \frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)}$$

```
[In] Int[ArcSin[a + b*x]^(-2),x]
```

```
[Out] -(Sqrt[1 - (a + b*x)^2]/(b*ArcSin[a + b*x])) - SinIntegral[ArcSin[a + b*x]]
/b
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
```

```
Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b} \\
&= -\frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)}\,dx, x, a+bx\right)}{b} \\
&= -\frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{Si}(\arcsin(a+bx))}{b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.90

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = -\frac{\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)} + \text{Si}(\arcsin(a+bx))}{b}$$

```
[In] Integrate[ArcSin[a + b*x]^(-2),x]
[Out] -((Sqrt[1 - (a + b*x)^2]/ArcSin[a + b*x] + SinIntegral[ArcSin[a + b*x]])/b)
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.93

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{\arcsin(bx+a)}-\mathrm{Si}(\arcsin(bx+a))}{b}$	38
default	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{\arcsin(bx+a)}-\mathrm{Si}(\arcsin(bx+a))}{b}$	38

```
[In] int(1/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] 1/b*(-1/arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)-Si(arcsin(b*x+a)))
```

Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(1/arcsin(b*x+a)^2,x, algorithm="fricas")
[Out] integral(arcsin(b*x + a)^(-2), x)
```

Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

```
[In] integrate(1/asin(b*x+a)**2,x)
[Out] Integral(asin(a + b*x)**(-2), x)
```

Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(1/arcsin(b*x+a)^2,x, algorithm="maxima")
[Out] (b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate(sqrt(b*
x + a + 1)*(b*x + a)*sqrt(-b*x - a + 1)/((b^2*x^2 + 2*a*b*x + a^2 - 1)*arct
an2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))), x) - sqrt(b*x + a + 1)
*sqrt(-b*x - a + 1))/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a +
1)))
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.95

$$\int \frac{1}{\arcsin(a+bx)^2} dx = -\frac{\operatorname{Si}(\arcsin(bx+a))}{b} - \frac{\sqrt{-(bx+a)^2+1}}{b \arcsin(bx+a)}$$

```
[In] integrate(1/arcsin(b*x+a)^2,x, algorithm="giac")
[Out] -sin_integral(arcsin(b*x + a))/b - sqrt(-(b*x + a)^2 + 1)/(b*arcsin(b*x + a
))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)^2} dx = \int \frac{1}{\operatorname{asin}(a+bx)^2} dx$$

```
[In] int(1/asin(a + b*x)^2,x)
[Out] int(1/asin(a + b*x)^2, x)
```

3.150 $\int \frac{1}{x \arcsin(a+bx)^2} dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)^2} dx = \operatorname{Int}\left(\frac{1}{x \arcsin(a+bx)^2}, x\right)$$

```
[Out] Unintegrable(1/x/arcsin(b*x+a)^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x \arcsin(a+bx)^2} dx = \int \frac{1}{x \arcsin(a+bx)^2} dx$$

```
[In] Int[1/(x*ArcSin[a + b*x]^2),x]
[Out] Defer[Subst][Defer[Int][1/((-(a/b) + x/b)*ArcSin[x]^2), x], x, a + b*x]/b
```

Rubi steps

$$\text{integral} = \frac{\operatorname{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\arcsin(x)^2} dx, x, a+bx\right)}{b}$$

Mathematica [N/A]

Not integrable

Time = 5.41 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin(a+bx)^2} \, dx$$

```
[In] Integrate[1/(x*ArcSin[a + b*x]^2),x]
[Out] Integrate[1/(x*ArcSin[a + b*x]^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 11.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin\left(bx+a\right)^{2}}dx$$

```
[In] int(1/x/arcsin(b*x+a)^2,x)
[Out] int(1/x/arcsin(b*x+a)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin\left(bx+a\right)^{2}} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^2,x, algorithm="fricas")
[Out] integral(1/(x*arcsin(b*x + a)^2), x)
```

Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \operatorname{asin}^{2}\left(a+bx\right)} \, dx$$

```
[In] integrate(1/x/asin(b*x+a)**2,x)
[Out] Integral(1/(x*asin(a + b*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 2.51 (sec) , antiderivative size = 174, normalized size of antiderivative = 14.50

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin(bx+a)^2} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^2,x, algorithm="maxima")
[Out] -(b*x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate((a*b
*x + a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^4 + 2*a*b^2*x^3
+ (a^2 - 1)*b*x^2)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))),
 x) + sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))/(b*x*arctan2(b*x + a, sqrt(b*x
+ a + 1)*sqrt(-b*x - a + 1)))
```

Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin(bx+a)^2} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^2,x, algorithm="giac")
[Out] integrate(1/(x*arcsin(b*x + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \,\mathrm{asin}\left(a+b\,x\right)^2} \, dx$$

```
[In] int(1/(x*asin(a + b*x)^2),x)
[Out] int(1/(x*asin(a + b*x)^2), x)
```

3.151 $\int \frac{x^2}{\arcsin(a+bx)^3} dx$

Optimal result

Integrand size = 12, antiderivative size = 176

$$\begin{aligned}\int \frac{x^2}{\arcsin(a+bx)^3} dx = &-\frac{x^2\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} \\ &+ \frac{9a+bx}{8b^3\arcsin(a+bx)} - \frac{(1+4a^2)\operatorname{CosIntegral}(\arcsin(a+bx))}{8b^3} \\ &+ \frac{9\operatorname{CosIntegral}(3\arcsin(a+bx))}{8b^3} \\ &- \frac{3\sin(3\arcsin(a+bx))}{8b^3\arcsin(a+bx)} + \frac{2a\operatorname{Si}(2\arcsin(a+bx))}{b^3}\end{aligned}$$

```
[Out] 1/2*a^2*(b*x+a)/b^3/arcsin(b*x+a)-2*a*(b*x+a)^2/b^3/arcsin(b*x+a)+1/8*(b*x+
9*a)/b^3/arcsin(b*x+a)-1/8*(4*a^2+1)*Ci(arcsin(b*x+a))/b^3+9/8*Ci(3*arcsin(
b*x+a))/b^3+2*a*Si(2*arcsin(b*x+a))/b^3-3/8*sin(3*arcsin(b*x+a))/b^3/arcsin
(b*x+a)-1/2*x^2*(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)^2
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.49, number of steps used = 24, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules

used = {4889, 4829, 4717, 4807, 4719, 3383, 4729, 4731, 4491, 12, 3380, 4737}

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = -\frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{2b^3}+\frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2}-\frac{\text{CosIntegral}(\arcsin(a+bx))}{8b^3} + \frac{9\,\text{CosIntegral}(3\arcsin(a+bx))}{8b^3}+\frac{2a\text{Si}(2\arcsin(a+bx))}{b^3} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)}-\frac{2a(a+bx)^2}{b^3\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)^2}{2b^3\arcsin(a+bx)^2} - \frac{a+bx}{b^3\arcsin(a+bx)}+\frac{a\sqrt{1-(a+bx)^2}(a+bx)}{b^3\arcsin(a+bx)^2}+\frac{a}{b^3\arcsin(a+bx)}$$

```
[In] Int[x^2/ArcSin[a + b*x]^3,x]
```

```
[Out] -1/2*(a^2*Sqrt[1 - (a + b*x)^2])/(b^3*ArcSin[a + b*x]^2) + (a*(a + b*x)*Sqr
t[1 - (a + b*x)^2])/(b^3*ArcSin[a + b*x]^2) - ((a + b*x)^2*Sqrt[1 - (a + b*
x)^2])/(2*b^3*ArcSin[a + b*x]^2) + a/(b^3*ArcSin[a + b*x]) - (a + b*x)/(b^3
*ArcSin[a + b*x]) + (a^2*(a + b*x))/(2*b^3*ArcSin[a + b*x]) - (2*a*(a + b*x
)^2)/(b^3*ArcSin[a + b*x]) + (3*(a + b*x)^3)/(2*b^3*ArcSin[a + b*x]) - CosI
ntegral[ArcSin[a + b*x]]/(8*b^3) - (a^2*CosIntegral[ArcSin[a + b*x]])/(2*b^
3) + (9*CosIntegral[3*ArcSin[a + b*x]])/(8*b^3) + (2*a*SinIntegral[2*ArcSin
[a + b*x]])/b^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{a^2}{b^2\arcsin(x)^3}-\frac{2ax}{b^2\arcsin(x)^3}+\frac{x^2}{b^2\arcsin(x)^3}\right)\,dx, x, a+bx\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{x^2}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b^3} - \frac{(2a)\text{Subst}\left(\int \frac{x}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b^3} + \frac{a^2\text{Subst}\left(\int \frac{1}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3} - \frac{3\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{2b^3} - \frac{a\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3} + \frac{(2a)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{b^3} - \frac{a^2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{2b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a}{b^3\arcsin(a+bx)} - \frac{a+bx}{b^3\arcsin(a+bx)} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)} + \frac{\text{Subst}\left(\int \frac{1}{\arcsin(x)}\,dx, x, a+bx\right)}{b^3} - \frac{9\text{Subst}\left(\int \frac{x^2}{\arcsin(x)}\,dx, x, a+bx\right)}{2b^3} + \frac{(4a)\text{Subst}\left(\int \frac{x}{\arcsin(x)}\,dx, x, a+bx\right)}{b^3} - \frac{a^2\text{Subst}\left(\int \frac{1}{\arcsin(x)}\,dx, x, a+bx\right)}{2b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a}{b^3\arcsin(a+bx)} - \frac{a+bx}{b^3\arcsin(a+bx)} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)} + \frac{\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{9\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b^3} + \frac{(4a)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3} - \frac{a^2\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a}{b^3\arcsin(a+bx)} - \frac{a+bx}{b^3\arcsin(a+bx)} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)} + \frac{\text{CosIntegral}(\arcsin(a+bx))}{b^3} - \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{2b^3} - \frac{9\text{Subst}\left(\int \left(\frac{\cos(x)}{4x} - \frac{\cos(3x)}{4x}\right)\,dx, x, \arcsin(a+bx)\right)}{2b^3} + \frac{(4a)\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a}{b^3\arcsin(a+bx)} - \frac{a+bx}{b^3\arcsin(a+bx)} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)} + \frac{\text{CosIntegral}(\arcsin(a+bx))}{b^3} - \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{2b^3} - \frac{9\text{Subst}\left(\int\frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{8b^3} + \frac{9\text{Subst}\left(\int\frac{\cos(3x)}{x}\,dx, x, \arcsin(a+bx)\right)}{8b^3} + \frac{(2a)\text{Subst}\left(\int\frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= -\frac{a^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a(a+bx)\sqrt{1-(a+bx)^2}}{b^3\arcsin(a+bx)^2} - \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{2b^3\arcsin(a+bx)^2} + \frac{a}{b^3\arcsin(a+bx)} - \frac{a+bx}{b^3\arcsin(a+bx)} + \frac{a^2(a+bx)}{2b^3\arcsin(a+bx)} - \frac{2a(a+bx)^2}{b^3\arcsin(a+bx)} + \frac{3(a+bx)^3}{2b^3\arcsin(a+bx)} - \frac{\text{CosIntegral}(\arcsin(a+bx))}{8b^3} - \frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))}{2b^3} + \frac{9\,\text{CosIntegral}(3\arcsin(a+bx))}{8b^3} + \frac{2a\text{Si}(2\arcsin(a+bx))}{b^3}$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.65

$$\int\frac{x^2}{\arcsin(a+bx)^3}\,dx = \frac{\frac{4bx\left(-bx\sqrt{1-a^2-2abx-b^2x^2}+(-2+2a^2+5abx+3b^2x^2)\arcsin(a+bx)\right)}{\arcsin(a+bx)^2} - (1+4a^2)\,\text{CosIntegral}(\arcsin(a+bx)) + 9\,\text{CosInte}}{8b^3}$$

```
[In] Integrate[x^2/ArcSin[a + b*x]^3,x]
```

```
[Out] ((4*b*x*(-(b*x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]) + (-2 + 2*a^2 + 5*a*b*x +
 3*b^2*x^2)*ArcSin[a + b*x]))/ArcSin[a + b*x]^2 - (1 + 4*a^2)*CosIntegral[A
rcSin[a + b*x]] + 9*CosIntegral[3*ArcSin[a + b*x]] + 16*a*SinIntegral[2*Arc
Sin[a + b*x]])/(8*b^3)
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.22

method	result
derivativedivides	$-\frac{\sqrt{1-(bx+a)^2}}{8\arcsin(bx+a)^2}+\frac{bx+a}{8\arcsin(bx+a)}-\frac{\mathrm{Ci}(\arcsin(bx+a))}{8}+\frac{\cos(3\arcsin(bx+a))}{8\arcsin(bx+a)^2}-\frac{3\sin(3\arcsin(bx+a))}{8\arcsin(bx+a)}+\frac{9\ \mathrm{Ci}(3\arcsin(bx+a))}{8}+\frac{a\left(4\ \mathrm{Si}(2\right.}{}$
default	$-\frac{\sqrt{1-(bx+a)^2}}{8\arcsin(bx+a)^2}+\frac{bx+a}{8\arcsin(bx+a)}-\frac{\mathrm{Ci}(\arcsin(bx+a))}{8}+\frac{\cos(3\arcsin(bx+a))}{8\arcsin(bx+a)^2}-\frac{3\sin(3\arcsin(bx+a))}{8\arcsin(bx+a)}+\frac{9\ \mathrm{Ci}(3\arcsin(bx+a))}{8}+\frac{a\left(4\ \mathrm{Si}(2\right.}{}$

```
[In] int(x^2/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(-1/8/arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+1/8*(b*x+a)/arcsin(b*x+a)-1
/8*Ci(arcsin(b*x+a))+1/8/arcsin(b*x+a)^2*cos(3*arcsin(b*x+a))-3/8/arcsin(b*
x+a)*sin(3*arcsin(b*x+a))+9/8*Ci(3*arcsin(b*x+a))+1/2*a*(4*Si(2*arcsin(b*x+
a))*arcsin(b*x+a)^2+2*cos(2*arcsin(b*x+a))*arcsin(b*x+a)+sin(2*arcsin(b*x+a
)))/arcsin(b*x+a)^2-1/2*a^2*(Ci(arcsin(b*x+a))*arcsin(b*x+a)^2-arcsin(b*x+a
)*(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a)^2)
```

Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx=\int \frac{x^2}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate(x^2/arcsin(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] integral(x^2/arcsin(b*x + a)^3, x)
```

Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx=\int \frac{x^2}{\operatorname{asin}^3\left(a+bx\right)}\,dx$$

```
[In] integrate(x**2/asin(b*x+a)**3,x)
```

```
[Out] Integral(x**2/asin(a + b*x)**3, x)
```

Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)^3}\,dx$$

[In] integrate(x^2/arcsin(b*x+a)^3,x, algorithm="maxima")

[Out] -1/2*(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x^2 + arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate((9*b^2*x^2 + 10*a*b*x + 2*a^2 - 2)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) - (3*b^2*x^3 + 5*a*b*x^2 + 2*(a^2 - 1)*x)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))/(b^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.55

$$\begin{aligned}\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = & -\frac{a^2\,\mathrm{Ci}\left(\arcsin\left(bx+a\right)\right)}{2\,b^3} + \frac{(bx+a)a^2}{2\,b^3\arcsin\left(bx+a\right)} \\ & + \frac{2\,a\,\mathrm{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{b^3} + \frac{3\left(\left(bx+a\right)^2-1\right)(bx+a)}{2\,b^3\arcsin\left(bx+a\right)} \\ & - \frac{2\left(\left(bx+a\right)^2-1\right)a}{b^3\arcsin\left(bx+a\right)} + \frac{9\,\mathrm{Ci}\left(3\,\arcsin\left(bx+a\right)\right)}{8\,b^3} \\ & - \frac{\mathrm{Ci}\left(\arcsin\left(bx+a\right)\right)}{8\,b^3} + \frac{\sqrt{-\left(bx+a\right)^2+1}(bx+a)a}{b^3\arcsin\left(bx+a\right)^2} \\ & - \frac{\sqrt{-\left(bx+a\right)^2+1}a^2}{2\,b^3\arcsin\left(bx+a\right)^2} + \frac{bx+a}{2\,b^3\arcsin\left(bx+a\right)} - \frac{a}{b^3\arcsin\left(bx+a\right)} \\ & + \frac{\left(-\left(bx+a\right)^2+1\right)^{\frac{3}{2}}}{2\,b^3\arcsin\left(bx+a\right)^2} - \frac{\sqrt{-\left(bx+a\right)^2+1}}{2\,b^3\arcsin\left(bx+a\right)^2}\end{aligned}$$

[In] integrate(x^2/arcsin(b*x+a)^3,x, algorithm="giac")

[Out] -1/2*a^2*cos_integral(arcsin(b*x + a))/b^3 + 1/2*(b*x + a)*a^2/(b^3*arcsin(b*x + a)) + 2*a*sin_integral(2*arcsin(b*x + a))/b^3 + 3/2*((b*x + a)^2 - 1)*(b*x + a)/(b^3*arcsin(b*x + a)) - 2*((b*x + a)^2 - 1)*a/(b^3*arcsin(b*x + a)) + 9/8*cos_integral(3*arcsin(b*x + a))/b^3 - 1/8*cos_integral(arcsin(b*x + a))/b^3 + sqrt(-(b*x + a)^2 + 1)*(b*x + a)*a/(b^3*arcsin(b*x + a)^2) - 1/2*sqrt(-(b*x + a)^2 + 1)*a^2/(b^3*arcsin(b*x + a)^2) + 1/2*(b*x + a)/(b^3*arcsin(b*x + a)) - a/(b^3*arcsin(b*x + a)) + 1/2*(-(b*x + a)^2 + 1)^(3/2)/(b^3*arcsin(b*x + a)^2) - 1/2*sqrt(-(b*x + a)^2 + 1)/(b^3*arcsin(b*x + a)^2)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

```
[In] int(x^2/asin(a + b*x)^3,x)
[Out] int(x^2/asin(a + b*x)^3, x)
```

3.152 $\int \frac{x}{\arcsin(a+bx)^3}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 108

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = -\frac{x\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2}-\frac{a(a+bx)}{2b^2\arcsin(a+bx)}-\frac{1-2(a+bx)^2}{2b^2\arcsin(a+bx)}+\frac{a\,\mathrm{CosIntegral}(\arcsin(a+bx))}{2b^2}-\frac{\mathrm{Si}(2\arcsin(a+bx))}{b^2}$$

```
[Out] -1/2*a*(b*x+a)/b^2/arcsin(b*x+a)+1/2*(-1+2*(b*x+a)^2)/b^2/arcsin(b*x+a)+1/2
*a*Ci(arcsin(b*x+a))/b^2-Si(2*arcsin(b*x+a))/b^2-1/2*x*(1-(b*x+a)^2)^(1/2)/
b/arcsin(b*x+a)^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.40, number of steps used = 14, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.200, Rules used = {4889, 4829, 4717, 4807, 4719, 3383, 4729, 4731, 4491, 12, 3380, 4737}

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \frac{a\,\mathrm{CosIntegral}(\arcsin(a+bx))}{2b^2}-\frac{\mathrm{Si}(2\arcsin(a+bx))}{b^2}+\frac{(a+bx)^2}{b^2\arcsin(a+bx)}-\frac{a(a+bx)}{2b^2\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2b^2\arcsin(a+bx)^2}-\frac{1}{2b^2\arcsin(a+bx)}+\frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2}$$

```
[In] Int[x/ArcSin[a + b*x]^3,x]
```

```
[Out] (a*Sqrt[1 - (a + b*x)^2])/(2*b^2*ArcSin[a + b*x]^2) - ((a + b*x)*Sqrt[1 - (
a + b*x)^2])/(2*b^2*ArcSin[a + b*x]^2) - 1/(2*b^2*ArcSin[a + b*x]) - (a*(a
```

```
+ b*x))/(2*b^2*ArcSin[a + b*x]) + (a + b*x)^2/(b^2*ArcSin[a + b*x]) + (a*Co
sIntegral[ArcSin[a + b*x]])/(2*b^2) - SinIntegral[2*ArcSin[a + b*x]]/b^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{-\frac{a}{b}+\frac{x}{b}}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b}\\
&= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\arcsin(x)^3}+\frac{x}{b\arcsin(x)^3}\right)\,dx, x, a+bx\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{x}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b^2}-\frac{a\text{Subst}\left(\int \frac{1}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b^2}\end{aligned}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)^2}dx, x, a+bx\right)}{2b^2} - \frac{\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\arcsin(x)^2}dx, x, a+bx\right)}{b^2} + \frac{a\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)^2}dx, x, a+bx\right)}{2b^2}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{1}{2b^2\arcsin(a+bx)} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} + \frac{(a+bx)^2}{b^2\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{x}{\arcsin(x)}dx, x, a+bx\right)}{b^2} + \frac{a\text{Subst}\left(\int \frac{1}{\arcsin(x)}dx, x, a+bx\right)}{2b^2}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{1}{2b^2\arcsin(a+bx)} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} + \frac{(a+bx)^2}{b^2\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}dx, x, \arcsin(a+bx)\right)}{b^2} + \frac{a\text{Subst}\left(\int \frac{\cos(x)}{x}dx, x, \arcsin(a+bx)\right)}{2b^2}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{1}{2b^2\arcsin(a+bx)} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} + \frac{(a+bx)^2}{b^2\arcsin(a+bx)} + \frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - \frac{2\text{Subst}\left(\int \frac{\sin(2x)}{2x}dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{1}{2b^2\arcsin(a+bx)} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} + \frac{(a+bx)^2}{b^2\arcsin(a+bx)} + \frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{a\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{2b^2\arcsin(a+bx)^2} - \frac{1}{2b^2\arcsin(a+bx)} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} + \frac{(a+bx)^2}{b^2\arcsin(a+bx)} + \frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - \frac{\text{Si}(2\arcsin(a+bx))}{b^2}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.12

$$\int \frac{x}{\arcsin(a+bx)^3} \, dx = -\frac{x\sqrt{1-a^2-2abx-b^2x^2}}{2b\arcsin(a+bx)^2} + \frac{-1+a^2+3abx+2b^2x^2}{2b^2\arcsin(a+bx)} - \frac{3a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - 2\left(-\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}\right)$$

```
[In] Integrate[x/ArcSin[a + b*x]^3,x]
```

```
[Out] -1/2*(x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/(b*ArcSin[a + b*x]^2) + (-1 + a^
2 + 3*a*b*x + 2*b^2*x^2)/(2*b^2*ArcSin[a + b*x]) - (3*a*CosIntegral[ArcSin[
a + b*x]])/(2*b^2) - 2*(-((a*CosIntegral[ArcSin[a + b*x]])/b^2) + SinIntegr
al[2*ArcSin[a + b*x]]/(2*b^2))
```

Maple [A] (verified)

Time = 0.52 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.01

method	result
derivativedivides	$\frac{-\frac{\sin(2\arcsin(bx+a))}{4\arcsin(bx+a)^2}-\frac{\cos(2\arcsin(bx+a))}{2\arcsin(bx+a)}-\text{Si}(2\arcsin(bx+a))+\frac{a\left(\text{Ci}(\arcsin(bx+a))\arcsin(bx+a)^2-\arcsin(bx+a)(bx+a)+\sqrt{1-(\right.}{2\arcsin(bx+a)^2}}{b^2}$
default	$\frac{-\frac{\sin(2\arcsin(bx+a))}{4\arcsin(bx+a)^2}-\frac{\cos(2\arcsin(bx+a))}{2\arcsin(bx+a)}-\text{Si}(2\arcsin(bx+a))+\frac{a\left(\text{Ci}(\arcsin(bx+a))\arcsin(bx+a)^2-\arcsin(bx+a)(bx+a)+\sqrt{1-(\right.}{2\arcsin(bx+a)^2}}{b^2}$

```
[In] int(x/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^2*(-1/4/arcsin(b*x+a)^2*sin(2*arcsin(b*x+a))-1/2/arcsin(b*x+a)*cos(2*ar
csin(b*x+a))-Si(2*arcsin(b*x+a))+1/2*a*(Ci(arcsin(b*x+a))*arcsin(b*x+a)^2-a
rcsin(b*x+a)*(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a)^2)
```

Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate(x/arcsin(b*x+a)^3,x, algorithm="fricas")
[Out] integral(x/arcsin(b*x + a)^3, x)
```

Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\operatorname{asin}^3\left(a+bx\right)}\,dx$$

```
[In] integrate(x/asin(b*x+a)**3,x)
[Out] Integral(x/asin(a + b*x)**3, x)
```

Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate(x/arcsin(b*x+a)^3,x, algorithm="maxima")
[Out] -1/2*(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate(
(4*b*x + 3*a)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) +
sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x - (2*b^2*x^2 + 3*a*b*x + a^2 - 1)*
arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))/(b^2*arctan2(b*x +
a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.29

$$\begin{aligned}\int \frac{x}{\arcsin(a+bx)^3}\,dx =& \frac{a\,\mathrm{Ci}\left(\arcsin\left(bx+a\right)\right)}{2\,b^2} - \frac{(bx+a)a}{2\,b^2\arcsin\left(bx+a\right)} - \frac{\mathrm{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{b^2} \\ &+ \frac{\left(bx+a\right)^2-1}{b^2\arcsin\left(bx+a\right)} - \frac{\sqrt{-\left(bx+a\right)^2+1}(bx+a)}{2\,b^2\arcsin\left(bx+a\right)^2} \\ &+ \frac{\sqrt{-\left(bx+a\right)^2+1}a}{2\,b^2\arcsin\left(bx+a\right)^2} + \frac{1}{2\,b^2\arcsin\left(bx+a\right)}\end{aligned}$$

```
[In] integrate(x/arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/2*a*cos_integral(arcsin(b*x + a))/b^2 - 1/2*(b*x + a)*a/(b^2*arcsin(b*x +
 a)) - sin_integral(2*arcsin(b*x + a))/b^2 + ((b*x + a)^2 - 1)/(b^2*arcsin(
b*x + a)) - 1/2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/(b^2*arcsin(b*x + a)^2) +
1/2*sqrt(-(b*x + a)^2 + 1)*a/(b^2*arcsin(b*x + a)^2) + 1/2/(b^2*arcsin(b*x
+ a))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

```
[In] int(x/asin(a + b*x)^3,x)
```

```
[Out] int(x/asin(a + b*x)^3, x)
```

3.153 $\int \frac{1}{\arcsin(a+bx)^3} dx$

Optimal result

Integrand size = 8, antiderivative size = 65

$$\int \frac{1}{\arcsin(a+bx)^3} dx = -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{CosIntegral}(\arcsin(a+bx))}{2b}$$

```
[Out] 1/2*(b*x+a)/b/arcsin(b*x+a)-1/2*Ci(arcsin(b*x+a))/b-1/2*(1-(b*x+a)^2)^(1/2)
/b/arcsin(b*x+a)^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.625$, Rules used = {4887, 4717, 4807, 4719, 3383}

$$\int \frac{1}{\arcsin(a+bx)^3} dx = -\frac{\text{CosIntegral}(\arcsin(a+bx))}{2b} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2}$$

```
[In] Int[ArcSin[a + b*x]^(-3),x]
```

```
[Out] -1/2*Sqrt[1 - (a + b*x)^2]/(b*ArcSin[a + b*x]^2) + (a + b*x)/(2*b*ArcSin[a
+ b*x]) - CosIntegral[ArcSin[a + b*x]]/(2*b)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{2b}$$

$$= -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{1}{\arcsin(x)}\,dx, x, a+bx\right)}{2b}$$

$$= -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b}$$

$$= -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{CosIntegral}(\arcsin(a+bx))}{2b}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)^3} \, dx = -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2}+\frac{a+bx}{2b\arcsin(a+bx)}-\frac{\text{CosIntegral}(\arcsin(a+bx))}{2b}$$

[In] Integrate[ArcSin[a + b*x]^(-3),x]

[Out] -1/2*Sqrt[1 - (a + b*x)^2]/(b*ArcSin[a + b*x]^2) + (a + b*x)/(2*b*ArcSin[a + b*x]) - CosIntegral[ArcSin[a + b*x]]/(2*b)

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.82

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{2\arcsin(bx+a)^2}+\frac{bx+a}{2\arcsin(bx+a)}-\frac{\text{Ci}(\arcsin(bx+a))}{2}}{b}$	53
default	$\frac{-\frac{\sqrt{1-(bx+a)^2}}{2\arcsin(bx+a)^2}+\frac{bx+a}{2\arcsin(bx+a)}-\frac{\text{Ci}(\arcsin(bx+a))}{2}}{b}$	53

[In] int(1/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)

[Out] 1/b*(-1/2/arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+1/2*(b*x+a)/arcsin(b*x+a)-1/2*Ci(arcsin(b*x+a)))

Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)^3} \, dx = \int \frac{1}{\arcsin\left(bx+a\right)^3} \, dx$$

[In] integrate(1/arcsin(b*x+a)^3,x, algorithm="fricas")

[Out] integral(arcsin(b*x + a)^(-3), x)

Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = \int \frac{1}{\operatorname{asin}^3{(a+bx)}}\,dx$$

```
[In] integrate(1/asin(b*x+a)**3,x)
```

```
[Out] Integral(asin(a + b*x)**(-3), x)
```

Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = \int \frac{1}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate(1/arcsin(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate(
1/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) - (b*x + a)*ar
ctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) + sqrt(b*x + a + 1)*sq
rt(-b*x - a + 1))/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))
^2)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.88

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = -\frac{\operatorname{Ci}\left(\arcsin\left(bx+a\right)\right)}{2\,b} + \frac{bx+a}{2\,b\arcsin\left(bx+a\right)} - \frac{\sqrt{-\left(bx+a\right)^2+1}}{2\,b\arcsin\left(bx+a\right)^2}$$

```
[In] integrate(1/arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] -1/2*cos_integral(arcsin(b*x + a))/b + 1/2*(b*x + a)/(b*arcsin(b*x + a)) -
1/2*sqrt(-(b*x + a)^2 + 1)/(b*arcsin(b*x + a)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = \int \frac{1}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

```
[In] int(1/asin(a + b*x)^3,x)
[Out] int(1/asin(a + b*x)^3, x)
```

3.154 $\int \frac{1}{x \arcsin(a+bx)^3} dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)^3} dx = \text{Int}\left(\frac{1}{x \arcsin(a+bx)^3}, x\right)$$

```
[Out] Unintegrable(1/x/arcsin(b*x+a)^3,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x \arcsin(a+bx)^3} dx = \int \frac{1}{x \arcsin(a+bx)^3} dx$$

```
[In] Int[1/(x*ArcSin[a + b*x]^3),x]
[Out] Defer[Subst][Defer[Int][1/((-(a/b) + x/b)*ArcSin[x]^3), x], x, a + b*x]/b
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\left(-\frac{a}{b}+\frac{x}{b}\right)\arcsin(x)^3} dx, x, a+bx\right)}{b}$$

Mathematica [N/A]

Not integrable

Time = 2.87 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin(a+bx)^3} \, dx$$

```
[In] Integrate[1/(x*ArcSin[a + b*x]^3),x]
[Out] Integrate[1/(x*ArcSin[a + b*x]^3), x]
```

Maple [N/A] (verified)

Not integrable

Time = 9.02 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin\left(bx+a\right)^{3}}dx$$

```
[In] int(1/x/arcsin(b*x+a)^3,x)
[Out] int(1/x/arcsin(b*x+a)^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin\left(bx+a\right)^{3}} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^3,x, algorithm="fricas")
[Out] integral(1/(x*arcsin(b*x + a)^3), x)
```

Sympy [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \operatorname{asin}^{3}\left(a+bx\right)} \, dx$$

```
[In] integrate(1/x/asin(b*x+a)**3,x)
[Out] Integral(1/(x*asin(a + b*x)**3), x)
```

Maxima [N/A]

Not integrable

Time = 57.49 (sec) , antiderivative size = 172, normalized size of antiderivative = 14.33

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin{(bx+a)}^3} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrat
e((a*b*x + 2*a^2 - 2)/(x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a
 + 1))), x) + sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x + (a*b*x + a^2 - 1)*
arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))/(b^2*x^2*arctan2(b*
x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

Giac [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin{(bx+a)}^3} \, dx$$

```
[In] integrate(1/x/arcsin(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate(1/(x*arcsin(b*x + a)^3), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \operatorname{asin}{(a+b\,x)}^3} \, dx$$

```
[In] int(1/(x*asin(a + b*x)^3),x)
```

```
[Out] int(1/(x*asin(a + b*x)^3), x)
```

3.155 $\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 535

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx=\frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3}+\frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}+\frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3}-\frac{\sqrt{b}c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3}-\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^3}-\frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3}+\frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d^3}+\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^3}+\frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^3}-\frac{\sqrt{b}c\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4d^3}-\frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d^3}$$

```
[Out] 1/72*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
)*b^(1/2)*6^(1/2)*Pi^(1/2)/d^3-1/72*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/d^3-1/8*cos(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2
)*Pi^(1/2)/d^3-1/2*c^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/d^3+1/8*FresnelC(2^(1/2)/Pi^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^3+
1/2*c^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/
b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^3-1/4*c*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x
+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^(1/2)*Pi^(1/2)/d^3-1/4*c*FresnelS(2*(a+b*arc
```

sin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*b^(1/2)*Pi^(1/2)/d^3+c^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^3+1/3*(d*x+c)^3*(a+b*arcsin(d*x+c))^(1/2)/d^3+1/2*c*cos(2*arcsin(d*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^3

Rubi [A] (verified)

Time = 1.63 (sec) , antiderivative size = 535, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4889, 4831, 6873, 6874, 3467, 3434, 3433, 3432, 3466, 3435, 3524, 3438}

$$\begin{aligned}\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx=&\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}c^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3}\\&-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}c^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3}\\&+\frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3}\\&+\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^3}\\&-\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d^3}\\&-\frac{\sqrt{\pi}\sqrt{b}c\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3}\\&-\frac{\sqrt{\pi}\sqrt{b}c\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3}\\&-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^3}\\&+\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d^3}\\&+\frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}\\&+\frac{c\cos(2\arcsin(c+dx))\sqrt{a+b\arcsin(c+dx)}}{2d^3}\end{aligned}$$

[In] Int[x^2*Sqrt[a + b*ArcSin[c + d*x]],x]

[Out] (c^2*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/d^3 + ((c + d*x)^3*Sqrt[a + b*ArcSin[c + d*x]])/(3*d^3) + (c*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c +

```
d*x]])/(2*d^3) - (Sqrt[b]*c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*Ar
cSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(4*d^3) - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]
*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*d^3) - (Sqr
t[b]*c^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]])/d^3 + (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(12*d^3) + (Sqrt[b]*Sqrt[Pi/2]*Fresne
lC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(4*d^3) + (S
qrt[b]*c^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqr
t[b]]*Sin[a/b])/d^3 - (Sqrt[b]*c*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c +
 d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(4*d^3) - (Sqrt[b]*Sqrt[Pi/6]*Fre
snelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(12*d
^3)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3438

```
Int[((a_.) + (b_.)*Sin[(c_.) + (d_.)*((e_.) + (f_.)*(x_))^(n_)])^(p_), x_Sy
mbol] :> Int[ExpandTrigReduce[(a + b*Sin[c + d*(e + f*x)^n])^p, x], x] /; F
reeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 1] && IGtQ[n, 1]
```

Rule 3466

```
Int[((e_.)*(x_))^(m_.)*Sin[(c_.) + (d_.)*(x_)^(n_)], x_Symbol] :> Simp[(-e^
(n - 1))*(e*x)^(m - n + 1)*(Cos[c + d*x^n]/(d*n)), x] + Dist[e^n*((m - n +
1)/(d*n)), Int[(e*x)^(m - n)*Cos[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x]
&& IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 3467

```
Int[Cos[(c_.) + (d_.)*(x_)^(n_)]*((e_.)*(x_))^(m_.), x_Symbol] :> Simp[e^(n
 - 1)*(e*x)^(m - n + 1)*(Sin[c + d*x^n]/(d*n)), x] - Dist[e^n*((m - n + 1)/
(d*n)), Int[(e*x)^(m - n)*Sin[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x] &&
IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 3524

```
Int[Cos[(a_.) + (b_.)*(x_)^(n_.)]*(x_)^(m_.)*Sin[(a_.) + (b_.)*(x_)^(n_.)]^
(p_.), x_Symbol] :> Simp[x^(m - n + 1)*(Sin[a + b*x^n]^(p + 1)/(b*n*(p + 1)
)), x] - Dist[(m - n + 1)/(b*n*(p + 1)), Int[x^(m - n)*Sin[a + b*x^n]^(p +
1), x], x] /; FreeQ[{a, b, p}, x] && LtQ[0, n, m + 1] && NeQ[p, -1]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)^2 \sqrt{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \sqrt{a+bx}\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)^2 dx, x, \arcsin(c+dx)\right)}{d}\\
&= \frac{2\text{Subst}\left(\int x^2\cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)^2 dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}
\end{aligned}$$

$$=\frac{2\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)^2dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$=\frac{2\text{Subst}\left(\int\left(c^2x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+cx^2\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)+x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x^2}{b}\right)\right)dx,x,\sqrt{a+}\right.}{bd^3}$$

$$=\frac{2\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}+\frac{(2c)\text{Subst}\left(\int x^2\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}+\frac{(2c^2)\,\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$=\frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3}+\frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}+\frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3}+\frac{\text{Subst}\left(\int\sin^3\left(\frac{a}{b}-\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{3d^3}-\frac{c\text{Subst}\left(\int\cos\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2d^3}+\frac{c^2\text{Subst}\left(\int\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^3}$$

$$=\frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3}+\frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}+\frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3}+\frac{\text{Subst}\left(\int\left(-\frac{1}{4}\sin\left(\frac{3a}{b}-\frac{3x^2}{b}\right)+\frac{3}{4}\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{3d^3}-\frac{\left(c^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^3}-\frac{\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2d^3}+\frac{\left(c^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^3}-\frac{\left(c\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2d^3}$$

$$
\begin{aligned}
&= \frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3} + \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3} \\
&+ \frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3} \\
&- \frac{\sqrt{b}c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3} \\
&- \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3} \\
&+ \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^3} \\
&- \frac{\sqrt{b}c\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4d^3} \\
&- \frac{\text{Subst}\left(\int\sin\left(\frac{3a}{b}-\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{12d^3} \\
&+ \frac{\text{Subst}\left(\int\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^3}
\end{aligned}
$$

$$= \frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3} + \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}$$
$$+ \frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3}$$
$$- \frac{\sqrt{b}c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3}$$
$$- \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3}$$
$$+ \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^3}$$
$$- \frac{\sqrt{b}c\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4d^3}$$
$$- \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^3}$$
$$+ \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{12d^3}$$
$$+ \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^3}$$
$$- \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{12d^3}$$

$$= \frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3} + \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3}$$
$$+ \frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3}$$
$$- \frac{\sqrt{b}c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3}$$
$$- \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^3}$$
$$- \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3}$$
$$+ \frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d^3}$$
$$+ \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^3}$$
$$+ \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^3}$$
$$- \frac{\sqrt{b}c\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4d^3}$$
$$- \frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d^3}$$

Mathematica [A] (verified)

Time = 3.25 (sec) , antiderivative size = 459, normalized size of antiderivative = 0.86

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$= \frac{18(c+dx)\sqrt{a+b\arcsin(c+dx)} + 72c^2(c+dx)\sqrt{a+b\arcsin(c+dx)} + 36c\sqrt{a+b\arcsin(c+dx)}\cos(2\,a}{}$$

```
[In] Integrate[x^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (18*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]] + 72*c^2*(c + d*x)*Sqrt[a + b*Arc
Sin[c + d*x]] + 36*c*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] - 1
8*Sqrt[b]*c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/
(Sqrt[b]*Sqrt[Pi])] - 9*Sqrt[b]*(1 + 4*c^2)*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(S
```

```
qrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sqrt[6*Pi]*Cos[(3
*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 9*Sqrt[
b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Si
n[a/b] + 36*Sqrt[b]*c^2*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]]*Sin[a/b] - 18*Sqrt[b]*c*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - Sqrt[b]*Sqrt[6*Pi]*Fre
snelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b] - 6*Sq
rt[a + b*ArcSin[c + d*x]]*Sin[3*ArcSin[c + d*x]])/(72*d^3)
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 777, normalized size of antiderivative = 1.45

method	result
default	$\frac{36\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b\,c^{2}+36\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\text{Fresn}}{}$

```
[In] int(x^2*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/72/d^3/(a+b*arcsin(d*x+c))^(1/2)*(36*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*b*c^2+36*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b)*b*c^2-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*b-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(3*a/b)
*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+9*
2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2
^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+9*2^(1/2)*Pi^(1
/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-18*Pi^(1/2)*(-1/b)^(1/2)*cos
(2*a/b)*(a+b*arcsin(d*x+c))^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b)*b*c+18*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*b*c-72*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b*c^2+3
6*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b*c-72*sin(-(a+b*arcsin
(d*x+c))/b+a/b)*a*c^2+6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b
-18*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+36*cos(-2*(a+b*arcsin(d
*x+c))/b+2*a/b)*a*c+6*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a-18*sin(-(a+b*ar
csin(d*x+c))/b+a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx$$

```
[In] integrate(x**2*(a+b*asin(d*x+c))**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin(dx+c)+a}x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(d*x + c) + a)*x^2, x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.45 (sec) , antiderivative size = 2255, normalized size of antiderivative = 4.21

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b^2*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/4*I*sqrt(2)*sqrt
```

(pi)*b^3*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/2*sqrt(2)*sqrt(pi)*a*b^2*c^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) - 1/4*I*sqrt(2)*sqrt(pi)*b^3*c^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) - sqrt(pi)*a*b*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^3) - sqrt(pi)*a*b*c^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^3) - 1/2*I*sqrt(pi)*a*b^(3/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^3) + 1/8*sqrt(pi)*b^(5/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^3) + 1/8*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/16*I*sqrt(2)*sqrt(pi)*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/8*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) - 1/16*I*sqrt(2)*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/2*I*sqrt(pi)*a*b^(3/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^3) + 1/8*sqrt(pi)*b^(5/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^3) - 1/2*I*sqrt(pi)*a*b*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d^3) - 1/4*sqrt(pi)*a*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*d^3) - 1/24*I*sqrt(pi)*b^(5/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*d^3) + 1/2*I*sqrt(pi)*a*sqrt(b)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d^3) - 1/4*sqrt(pi)*a*b^(3/2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*d^3) + 1/24*I*sqrt(pi)*b^(5/

```
2)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqr
t(6)*b^3/abs(b))*d^3) - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*c^2*e^(I*arcsin(d
*x + c))/d^3 + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*c^2*e^(-I*arcsin(d*x + c))
/d^3 + 1/4*sqrt(pi)*a*b*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b
) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(
(sqrt(6)*b^(3/2) + I*sqrt(6)*b^(5/2)/abs(b))*d^3) - 1/4*sqrt(pi)*a*b*erf(-1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b))
 + sqrt(2)*b*sqrt(abs(b)))*d^3) - 1/4*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt
(abs(b)))*d^3) + 1/4*sqrt(pi)*a*b*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(
-3*I*a/b)/((sqrt(6)*b^(3/2) - I*sqrt(6)*b^(5/2)/abs(b))*d^3) + 1/4*sqrt(b*a
rcsin(d*x + c) + a)*c*e^(2*I*arcsin(d*x + c))/d^3 + 1/4*sqrt(b*arcsin(d*x +
 c) + a)*c*e^(-2*I*arcsin(d*x + c))/d^3 + 1/24*I*sqrt(b*arcsin(d*x + c) + a
)*e^(3*I*arcsin(d*x + c))/d^3 - 1/8*I*sqrt(b*arcsin(d*x + c) + a)*e^(I*arcs
in(d*x + c))/d^3 + 1/8*I*sqrt(b*arcsin(d*x + c) + a)*e^(-I*arcsin(d*x + c))
/d^3 - 1/24*I*sqrt(b*arcsin(d*x + c) + a)*e^(-3*I*arcsin(d*x + c))/d^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx=\int x^2\,\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

```
[In] int(x^2*(a + b*asin(c + d*x))^(1/2),x)
[Out] int(x^2*(a + b*asin(c + d*x))^(1/2), x)
```

3.156 $\int x\sqrt{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 269

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = -\frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{4d^2} + \frac{\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d^2} + \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^2} - \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^2} + \frac{\sqrt{b}\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d^2}$$

```
[Out] 1/2*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))
*b^(1/2)*2^(1/2)*Pi^(1/2)/d^2-1/2*c*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^2+1/8*cos(2*a/b)*
FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^(1/2)*Pi^(1/2)/d^2
+1/8*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*b^(1
/2)*Pi^(1/2)/d^2-c*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^2-1/4*cos(2*arcsin(d
*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^2
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4889, 4831, 6873, 6874, 3467, 3434, 3433, 3432, 3466, 3435}

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = -\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^2} + \frac{\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d^2} + \frac{\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d^2} + \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}c\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^2} - \frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\cos(2\arcsin(c+dx))\sqrt{a+b\arcsin(c+dx)}}{4d^2}$$

```
[In] Int[x*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] -((c*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/d^2) - (Sqrt[a + b*ArcSin[c + d
*x]]*Cos[2*ArcSin[c + d*x]])/(4*d^2) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*Fresn
elC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*d^2) + (Sqrt[b]
*c*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sq
rt[b]])/d^2 - (Sqrt[b]*c*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]*Sin[a/b])/d^2 + (Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a +
b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*d^2)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
```

```
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3466

```
Int[((e_.)*(x_))^(m_.)*Sin[(c_.) + (d_.)*(x_)^(n_)], x_Symbol] :> Simp[(-e^
(n - 1))*(e*x)^(m - n + 1)*(Cos[c + d*x^n]/(d*n)), x] + Dist[e^n*((m - n +
1)/(d*n)), Int[(e*x)^(m - n)*Cos[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x]
&& IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 3467

```
Int[Cos[(c_.) + (d_.)*(x_)^(n_)]*((e_.)*(x_))^(m_.), x_Symbol] :> Simp[e^(n
 - 1)*(e*x)^(m - n + 1)*(Sin[c + d*x^n]/(d*n)), x] - Dist[e^n*((m - n + 1)/
(d*n)), Int[(e*x)^(m - n)*Sin[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x] &&
IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \sqrt{a+bx}\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)\,dx,x,\arcsin(c+dx)\right)}{d}$$

$$= -\frac{2\text{Subst}\left(\int x^2\cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int \left(cx^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+\frac{1}{2}x^2\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{\text{Subst}\left(\int x^2\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} - \frac{(2c)\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{4d^2} + \frac{\text{Subst}\left(\int \cos\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{c\text{Subst}\left(\int \sin\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^2}$$

$$= -\frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{4d^2} + \frac{\left(c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^2} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{\left(c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{d^2} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d^2}$$

$$= -\frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{4d^2} + \frac{\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d^2} + \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^2} - \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^2} + \frac{\sqrt{b}\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.26 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.92

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$= \frac{-2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx)) + \sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right) - \frac{4bce^{-\frac{ia}{b}}(\sqrt{}}{}}{}$$

```
[In] Integrate[x*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (-2*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt[Pi]*C
os[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] -
(4*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcS
in[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin[c +
d*x]]) + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]
*Sqrt[Pi])]*Sin[(2*a)/b])/(8*d^2)
```

Maple [A] (verified)

Time = 1.11 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.45

method	result
default	$-\frac{4\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(dx+c)}\,\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{a}{b}\right)bc+4\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\text{Fresne}}{}$

```
[In] int(x*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d^2/(a+b*arcsin(d*x+c))^(1/2)*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)/b)*cos(a/b)*b*c+4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b)*b*c-(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fr
esnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+(-1/b
)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi
^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-8*arcsin(d*x+c)*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*b*c+2*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*
a/b)*b-8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*c+2*cos(-2*(a+b*arcsin(d*x+c))/b
+2*a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = \int x\sqrt{a+b\operatorname{asin}(c+dx)}\,dx$$

```
[In] integrate(x*(a+b*asin(d*x+c))**(1/2),x)
```

```
[Out] Integral(x*sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin(dx+c)+a}\,x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(d*x + c) + a)*x, x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.00 (sec) , antiderivative size = 1079, normalized size of antiderivative = 4.01

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(2)*sqrt(pi)*a*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^
(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/4*I*sqrt(2)*sqrt(
pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt
(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*sqrt(2)*sqrt(pi)*a*b^2*c*erf(1/2*I*
sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt
(abs(b)))*d^2) + 1/4*I*sqrt(2)*sqrt(pi)*b^3*c*erf(1/2*I*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqr
t(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) + sq
rt(pi)*a*b*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(
2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^2) + sqrt(pi)*a*b*c*erf(1/2
*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b))
 + sqrt(2)*b*sqrt(abs(b)))*d^2) + 1/4*I*sqrt(pi)*a*b^(3/2)*erf(-sqrt(b*arcs
in(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^
(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^2) - 1/16*sqrt(pi)*b^(5/2)*erf(-sqrt(b*ar
csin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*
e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^2) - 1/4*I*sqrt(pi)*a*b^(3/2)*erf(-sqrt
(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs
(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^2) - 1/16*sqrt(pi)*b^(5/2)*erf(-s
qrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^2) + 1/4*I*sqrt(pi)*a*b*erf(-s
qrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d^2) - 1/4*I*sqrt(pi)*a*
sqrt(b)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c)
 + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d^2) + 1/2*I*sqrt(b*a
rcsin(d*x + c) + a)*c*e^(I*arcsin(d*x + c))/d^2 - 1/2*I*sqrt(b*arcsin(d*x +
 c) + a)*c*e^(-I*arcsin(d*x + c))/d^2 - 1/8*sqrt(b*arcsin(d*x + c) + a)*e^(
2*I*arcsin(d*x + c))/d^2 - 1/8*sqrt(b*arcsin(d*x + c) + a)*e^(-2*I*arcsin(d
*x + c))/d^2
```

Mupad [F(-1)]

Timed out.

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx=\int x\,\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int(x*(a + b*asin(c + d*x))^(1/2),x)
[Out] int(x*(a + b*asin(c + d*x))^(1/2), x)
```

3.157 $\int \sqrt{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 133

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d}$$

```
[Out] -1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*
b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+(d*x+c)*(a+b*arcsin(d*
x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4887, 4715, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} + \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}$$

```
[In] Int[Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/d - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/d + (Sqrt[b]*Sqrt
[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])
/d
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
```

```
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \sqrt{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{b\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$=\frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c
 + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/
2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c +
d*x]])
```

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.53

method	result
default	$-\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\right.}{2d\sqrt{a+b\arcsin(dx+c)}}$

```
[In] int((a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d/(a+b*arcsin(d*x+c))^(1/2)*(-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*b-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*b+2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+b*arcsin(d
*x+c))/b+a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

Sympy [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$

[In] integrate((a+b*asin(d*x+c))**(1/2),x)

[Out] Integral(sqrt(a + b*asin(c + d*x)), x)

Maxima [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin(dx+c)+a}\,dx$$

[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(b*arcsin(d*x + c) + a), x)

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 563, normalized size of antiderivative = 4.23

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}a\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}a\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(i\arcsin(dx+c))}}{2d}+\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(-i\arcsin(dx+c))}}{2d}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/
b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/4*I*sqrt(2)*sqrt(pi)*b^2*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) +
b*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqr
t(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/4*I*
sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs
(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(
(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a*erf(-1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqr
t(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/
```

```
b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/2*I*sqrt(b*ar
csin(d*x + c) + a)*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) +
 a)*e^(-I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(1/2),x)
[Out] int((a + b*asin(c + d*x))^(1/2), x)
```

3.158 $\int x(a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 343

$$\begin{aligned}\int x(a+b\arcsin(c+dx))^{3/2}\,dx &= -\frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2}\\
&\quad-\frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2}\\
&\quad-\frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2}\\
&\quad+\frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d^2}\\
&\quad-\frac{3b^{3/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d^2}\\
&\quad+\frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d^2}\\
&\quad+\frac{3b^{3/2}\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d^2}\\
&\quad+\frac{3b\sqrt{a+b\arcsin(c+dx)}\sin(2\arcsin(c+dx))}{16d^2}\end{aligned}$$

```
[Out] -c*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d^2-1/4*(a+b*arcsin(d*x+c))^(3/2)*cos(
2*arcsin(d*x+c))/d^2+3/4*b^(3/2)*c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2+3/4*b^(3/2)*c*FresnelS(2
^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2
)/d^2-3/32*b^(3/2)*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/
Pi^(1/2))*Pi^(1/2)/d^2+3/32*b^(3/2)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d^2+3/16*b*sin(2*arcsin(d*x+c))*(a+b*ar
```

```
csin(d*x+c))^(1/2)/d^2-3/2*b*c*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/d^2
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.625$, Rules used = {4889, 4831, 6873, 6874, 3467, 3466, 3435, 3433, 3432, 3434}

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{3\sqrt{\pi}b^{3/2}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d^2} + \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d^2} + \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}c\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d^2} - \frac{3\sqrt{\pi}b^{3/2}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d^2} - \frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2} + \frac{3b\sin(2\arcsin(c+dx))\sqrt{a+b\arcsin(c+dx)}}{16d^2} - \frac{\cos(2\arcsin(c+dx))(a+b\arcsin(c+dx))^{3/2}}{4d^2}$$

```
[In] Int[x*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (-3*b*c*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(2*d^2) - (c*(c
+ d*x)*(a + b*ArcSin[c + d*x])^(3/2))/d^2 - ((a + b*ArcSin[c + d*x])^(3/2)*
Cos[2*ArcSin[c + d*x]])/(4*d^2) + (3*b^(3/2)*c*Sqrt[Pi/2]*Cos[a/b]*FresnelC
[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(2*d^2) - (3*b^(3/2)*Sq
rt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[
Pi])])/(32*d^2) + (3*b^(3/2)*c*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(2*d^2) + (3*b^(3/2)*Sqrt[Pi]*FresnelC[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(32*d^2)
+ (3*b*Sqrt[a + b*ArcSin[c + d*x]]*Sin[2*ArcSin[c + d*x]])/(16*d^2)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3466

```
Int[((e_.)*(x_))^(m_.)*Sin[(c_.) + (d_.)*(x_)^(n_)], x_Symbol] :> Simp[(-e^
(n - 1))*(e*x)^(m - n + 1)*(Cos[c + d*x^n]/(d*n)), x] + Dist[e^n*((m - n +
1)/(d*n)), Int[(e*x)^(m - n)*Cos[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x]
&& IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 3467

```
Int[Cos[(c_.) + (d_.)*(x_)^(n_)]*((e_.)*(x_))^(m_.), x_Symbol] :> Simp[e^(n
 - 1)*(e*x)^(m - n + 1)*(Sin[c + d*x^n]/(d*n)), x] - Dist[e^n*((m - n + 1)/
(d*n)), Int[(e*x)^(m - n)*Sin[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x] &&
IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)(a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^{3/2}\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)\,dx, x, \arcsin(c+dx)\right)}{d}$$

$$= -\frac{2\text{Subst}\left(\int x^4\cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int x^4\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int \left(cx^4\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+\frac{1}{2}x^4\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{\text{Subst}\left(\int x^4\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} - \frac{(2c)\text{Subst}\left(\int x^4\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2} - \frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2} + \frac{3\text{Subst}\left(\int x^2\cos\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{(3c)\text{Subst}\left(\int x^2\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d^2}$$

$$= -\frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2}$$
$$- \frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2}$$
$$+ \frac{3b\sqrt{a+b\arcsin(c+dx)}\sin(2\arcsin(c+dx))}{16d^2}$$
$$+ \frac{(3b)\text{Subst}\left(\int \sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d^2}$$
$$+ \frac{(3bc)\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d^2}$$

$$= -\frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2}$$
$$- \frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2}$$
$$+ \frac{3b\sqrt{a+b\arcsin(c+dx)}\sin(2\arcsin(c+dx))}{16d^2}$$
$$+ \frac{\left(3bc\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d^2}$$
$$- \frac{\left(3b\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d^2}$$
$$+ \frac{\left(3bc\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d^2}$$
$$+ \frac{\left(3b\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d^2}$$

$$= -\frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2}$$
$$- \frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2}$$
$$+ \frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d^2}$$
$$- \frac{3b^{3/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d^2}$$
$$+ \frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d^2}$$
$$+ \frac{3b^{3/2}\sqrt{\pi}\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d^2}$$
$$+ \frac{3b\sqrt{a+b\arcsin(c+dx)}\sin(2\arcsin(c+dx))}{16d^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 8.88 (sec) , antiderivative size = 610, normalized size of antiderivative = 1.78

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx =$$
$$-\frac{abce^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d^2\sqrt{a+b\arcsin(c+dx)}}$$
$$-\frac{\sqrt{b}c\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+\cdots}}{\cdots}\right.\cdots}{4d\cdots}$$
$$+\frac{a\left(-2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))+\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{b}\sqrt{\pi}\cdots\right.}{8d^2}$$
$$+\frac{\sqrt{b}\left(-\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\left(3b\cos\left(\frac{2a}{b}\right)+4a\sin\left(\frac{2a}{b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)(4a\,\text{co}\cdots\right.}{\cdots}$$

```
[In] Integrate[x*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] -1/2*(a*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b
*ArcSin[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]
*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d^2*E^((I*a)/b)*Sqrt[a + b*Ar
cSin[c + d*x]]) - (Sqrt[b]*c*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*Sqrt
```

[1 - (c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b])
 + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(2
*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*d^2) + (a*(-2*Sqrt[a + b*ArcSin[c + d*x]]*
Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a +
 b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqr
t[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/(8*d^2) + (Sqr
t[b]*(-(Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi]
)]*(3*b*Cos[(2*a)/b] + 4*a*Sin[(2*a)/b])) - Sqrt[Pi]*FresnelC[(2*Sqrt[a + b
*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*(4*a*Cos[(2*a)/b] - 3*b*Sin[(2*a)/b]
) + 2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(-4*ArcSin[c + d*x]*Cos[2*ArcSin[
c + d*x]] + 3*Sin[2*ArcSin[c + d*x]])))/(32*d^2)

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 598 vs. 2(275) = 550.

Time = 1.27 (sec) , antiderivative size = 599, normalized size of antiderivative = 1.75

method	result
default	$-\frac{-24\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b^{2}c+24\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{Fr}}{}$

[In] int(x*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/32/d^2/(a+b*arcsin(d*x+c))^(1/2)*(-24*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b)*b^2*c+24*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b)*b^2*c-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos
(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*b^2-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*Fresnel
C(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-32*arcsi
n(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2*c+8*arcsin(d*x+c)^2*cos(-2*(
a+b*arcsin(d*x+c))/b+2*a/b)*b^2-64*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b
+a/b)*a*b*c+48*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2*c+16*arcsi
n(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+6*arcsin(d*x+c)*sin(-2*(a+
b*arcsin(d*x+c))/b+2*a/b)*b^2-32*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*c+48*c
os(-(a+b*arcsin(d*x+c))/b+a/b)*a*b*c+8*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*
a^2+6*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b)

Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \int x(a+b\operatorname{asin}(c+dx))^{\frac{3}{2}}\,dx$$

```
[In] integrate(x*(a+b*asin(d*x+c))**(3/2),x)
[Out] Integral(x*(a + b*asin(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{3}{2}}x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(3/2)*x, x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.02 (sec) , antiderivative size = 1987, normalized size of antiderivative = 5.79

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] -1/2*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*I*sqrt(2)*sqr
```

t(pi)*a*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/
sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(
1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^
2*sqrt(abs(b)))*d^2) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*c*erf(1/2*I*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d
^2) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d^2) - 3/8*sqrt(2)*sq
rt(pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/s
qrt(abs(b)) + b*sqrt(abs(b)))*d^2) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*c*erf(1/2
*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqr
t(abs(b)))*d^2) - 3/8*sqrt(2)*sqrt(pi)*b^3*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d^2) + sqrt(
pi)*a^2*b*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1
/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2
)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^2) + sqrt(pi)*a^2*b*c*erf(1/
2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*a
rcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)
) + sqrt(2)*b*sqrt(abs(b)))*d^2) + 1/4*I*sqrt(pi)*a^2*b^(3/2)*erf(-sqrt(b*a
rcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))
*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^2) - 1/8*sqrt(pi)*a*b^(5/2)*erf(-sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(
b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^2) - 1/4*I*sqrt(pi)*a^2*b^(3/2)*erf
(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(
b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^2) - 1/8*sqrt(pi)*a*b^(5/2)
*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*s
qrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d^2) + 1/2*I*sqrt(b*arcsi
n(d*x + c) + a)*b*c*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d^2 - 1/2*I*sqrt(
b*arcsin(d*x + c) + a)*b*c*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d^2 + 1/8
*sqrt(pi)*a*b^2*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(
d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d^2
) + 1/4*I*sqrt(pi)*a^2*b*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(
b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/a
bs(b))*d^2) + 1/8*sqrt(pi)*a*b^2*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b
^(5/2)/abs(b))*d^2) - 1/4*I*sqrt(pi)*a^2*sqrt(b)*erf(-sqrt(b*arcsin(d*x + c
) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/
((b + I*b^2/abs(b))*d^2) + 3/64*I*sqrt(pi)*b^(5/2)*erf(-sqrt(b*arcsin(d*x +
c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b

```
)/((b + I*b^2/abs(b))*d^2) - 3/64*I*sqrt(pi)*b^(5/2)*erf(-sqrt(b*arcsin(d*x
 + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*
a/b)/((b - I*b^2/abs(b))*d^2) - 1/8*sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*
x + c)*e^(2*I*arcsin(d*x + c))/d^2 + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a*c*
e^(I*arcsin(d*x + c))/d^2 - 3/4*sqrt(b*arcsin(d*x + c) + a)*b*c*e^(I*arcsin
(d*x + c))/d^2 - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a*c*e^(-I*arcsin(d*x + c
))/d^2 - 3/4*sqrt(b*arcsin(d*x + c) + a)*b*c*e^(-I*arcsin(d*x + c))/d^2 - 1
/8*sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c))/d
^2 - 1/8*sqrt(b*arcsin(d*x + c) + a)*a*e^(2*I*arcsin(d*x + c))/d^2 - 3/32*I
*sqrt(b*arcsin(d*x + c) + a)*b*e^(2*I*arcsin(d*x + c))/d^2 - 1/8*sqrt(b*arc
sin(d*x + c) + a)*a*e^(-2*I*arcsin(d*x + c))/d^2 + 3/32*I*sqrt(b*arcsin(d*x
 + c) + a)*b*e^(-2*I*arcsin(d*x + c))/d^2
```

Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

```
[In] int(x*(a + b*asin(c + d*x))^(3/2),x)
[Out] int(x*(a + b*asin(c + d*x))^(3/2), x)
```

3.159 $\int (a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 175

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

```
[Out] (d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/P
i^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/4*b^(3/2)*F
resnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2
)*Pi^(1/2)/d+3/2*b*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {4887, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}+\frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (3*b*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(2*d) + ((c + d*x)*
(a + b*ArcSin[c + d*x])^(3/2))/d - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(2*d) - (3*b^(3/2)*Sqrt[
Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/
(2*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{d} \\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{(3b)\text{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d} \\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} \\
&\quad - \frac{(3b^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{4d} \\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} \\
&\quad - \frac{(3b)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4d} \\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} \\
&\quad - \frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4d} \\
&\quad - \frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4d}
\end{aligned}$$

$$= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d} - \frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d}$$

$$= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.29 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.78

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \frac{abe^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right.\right.}{2d\sqrt{a+b\arcsin(c+dx)}} + \frac{\sqrt{b}\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b}\right.\right.}{4d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (a*b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin
[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c
+ d*x]]) + (Sqrt[b]*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*Sqrt[1 - (c +
 d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b]) + Sqrt[2
*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(2*a*Cos[a/
b] - 3*b*Sin[a/b])))/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 303 vs. $2(139) = 278$.

Time = 0.74 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.74

method	result
default	$-\frac{3\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,b^2-3\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\,\mathrm{ar}}}{\sqrt{\pi}\,\sqrt{}}\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*(3*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-3*(
a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+4*arcsin(d*x+c
)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c)*sin(-(a+b*arcsin(d*
x+c))/b+a/b)*a*b-6*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+4*sin(
-(a+b*arcsin(d*x+c))/b+a/b)*a^2-6*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b
*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \int (a+b\,\mathrm{asin}\,(c+dx))^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.91 (sec) , antiderivative size = 1061, normalized size of antiderivative = 6.06

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)
*a*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(ab
s(b)) + b^2*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(
b)))*d) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 1/2*I*sqrt(
2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*
b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(-1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(ab
s(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)
*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2
/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a^2*b*erf(-1/2*I*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt
(abs(b)))*d) - sqrt(pi)*a^2*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
```

```
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - 1/2*I*
sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + 1/2
*I*sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d -
 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(I*arcsin(d*x + c))/d + 3/4*sqrt(b*a
rcsin(d*x + c) + a)*b*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c
) + a)*a*e^(-I*arcsin(d*x + c))/d + 3/4*sqrt(b*arcsin(d*x + c) + a)*b*e^(-I
*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(3/2),x)
[Out] int((a + b*asin(c + d*x))^(3/2), x)
```

3.160 $\int x(a+b\arcsin(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 406

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2}-\frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2}-\frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2}+\frac{15b^2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{64d^2}-\frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2}-\frac{15b^{5/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d^2}-\frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^2}+\frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^2}-\frac{15b^{5/2}\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d^2}+\frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2}$$

```
[Out] -c*(d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d^2-1/4*(a+b*arcsin(d*x+c))^(5/2)*cos(
2*arcsin(d*x+c))/d^2+5/16*b*(a+b*arcsin(d*x+c))^(3/2)*sin(2*arcsin(d*x+c))/
```

```
d^2-15/8*b^(5/2)*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2+15/8*b^(5/2)*c*FresnelC(2^(1/2)/Pi^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^2-15/128*b^
(5/2)*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^
(1/2)/d^2-15/128*b^(5/2)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1
/2))*sin(2*a/b)*Pi^(1/2)/d^2-5/2*b*c*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2
)^(1/2)/d^2+15/4*b^2*c*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^2+15/64*b^2*cos(
2*arcsin(d*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^2
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 406, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4889, 4831, 6873, 6874, 3467, 3466, 3434, 3433, 3432, 3435}

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\frac{15\sqrt{\frac{\pi}{2}}b^{5/2}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^2}-\frac{15\sqrt{\pi}b^{5/2}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d^2}-\frac{15\sqrt{\pi}b^{5/2}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d^2}-\frac{15\sqrt{\frac{\pi}{2}}b^{5/2}c\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^2}+\frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2}+\frac{15b^2\cos(2\arcsin(c+dx))\sqrt{a+b\arcsin(c+dx)}}{64d^2}-\frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2}-\frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2}+\frac{5b\sin(2\arcsin(c+dx))(a+b\arcsin(c+dx))^{3/2}}{16d^2}-\frac{\cos(2\arcsin(c+dx))(a+b\arcsin(c+dx))^{5/2}}{4d^2}$$

```
[In] Int[x*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (15*b^2*c*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/(4*d^2) - (5*b*c*Sqrt[1 -
(c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2))/(2*d^2) - (c*(c + d*x)*(a + b*A
rcSin[c + d*x])^(5/2))/d^2 + (15*b^2*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcS
in[c + d*x]])/(64*d^2) - ((a + b*ArcSin[c + d*x])^(5/2)*Cos[2*ArcSin[c + d*
x]])/(4*d^2) - (15*b^(5/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*Arc
Sin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(128*d^2) - (15*b^(5/2)*c*Sqrt[Pi/2]*Co
s[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*d^2)
+ (15*b^(5/2)*c*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]]
)/Sqrt[b]]*Sin[a/b])/(4*d^2) - (15*b^(5/2)*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(128*d^2) + (5*b*(a + b
*ArcSin[c + d*x])^(3/2)*Sin[2*ArcSin[c + d*x]])/(16*d^2)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3466

```
Int[((e_.)*(x_))^(m_.)*Sin[(c_.) + (d_.)*(x_)^(n_)], x_Symbol] :> Simp[(-e^
(n - 1))*(e*x)^(m - n + 1)*(Cos[c + d*x^n]/(d*n)), x] + Dist[e^n*((m - n +
1)/(d*n)), Int[(e*x)^(m - n)*Cos[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x]
&& IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 3467

```
Int[Cos[(c_.) + (d_.)*(x_)^(n_)]*((e_.)*(x_))^(m_.), x_Symbol] :> Simp[e^(n
 - 1)*(e*x)^(m - n + 1)*(Sin[c + d*x^n]/(d*n)), x] - Dist[e^n*((m - n + 1)/
(d*n)), Int[(e*x)^(m - n)*Sin[c + d*x^n], x], x] /; FreeQ[{c, d, e}, x] &&
IGtQ[n, 0] && LtQ[n, m + 1]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int (a+bx)^{5/2}\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)\,dx,x,\arcsin(c+dx)\right)}{d}\\
&= -\frac{2\text{Subst}\left(\int x^6\cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}\\
&= -\frac{2\text{Subst}\left(\int x^6\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}\\
&= -\frac{2\text{Subst}\left(\int \left(cx^6\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+\frac{1}{2}x^6\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}\\
&= -\frac{\text{Subst}\left(\int x^6\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}\\
&\quad -\frac{(2c)\text{Subst}\left(\int x^6\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}
\end{aligned}$$

$$= -\frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} - \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} + \frac{5\text{Subst}\left(\int x^4\cos\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{(5c)\text{Subst}\left(\int x^4\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d^2}$$

$$= -\frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} - \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} + \frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2} + \frac{(15b)\text{Subst}\left(\int x^2\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d^2} + \frac{(15bc)\text{Subst}\left(\int x^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d^2}$$

$$= \frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2} - \frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} + \frac{15b^2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{64d^2} - \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} + \frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2} - \frac{(15b^2)\,\text{Subst}\left(\int\cos\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{64d^2} + \frac{(15b^2c)\,\text{Subst}\left(\int\sin\left(\frac{a}{b}-\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d^2}$$

$$= \frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2} - \frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} + \frac{15b^2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{64d^2} - \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} + \frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2} - \frac{\left(15b^2c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{\left(15b^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{64d^2} + \frac{\left(15b^2c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d^2} - \frac{\left(15b^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{64d^2}$$

$$= \frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2} - \frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2} - \frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} + \frac{15b^2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{64d^2} - \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} - \frac{15b^{5/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d^2} - \frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^2} + \frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^2} - \frac{15b^{5/2}\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d^2} + \frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 11.98 (sec) , antiderivative size = 1043, normalized size of antiderivative = 2.57

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx =$$

$$-\frac{a^2bce^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d^2\sqrt{a+b\arcsin(c+dx)}}$$

$$-\frac{a\sqrt{b}c\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a}\cdots}{}\right.\right.}{2d\cdots}$$

$$-\frac{\sqrt{b}c\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(-2\sqrt{1-(c+dx)^2}(a-5b\arcsin(c+dx))+b(c+dx)\left(-15+4\arcsin(\cdots\right.\right.\right.}{}$$

$$+\frac{a^2\left(-2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))+\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{b}\sqrt{\pi}\cdots\right.}{8d^2}$$

$$+\frac{a\sqrt{b}\left(-\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\left(3b\cos\left(\frac{2a}{b}\right)+4a\sin\left(\frac{2a}{b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)(4a\,\text{c}\cdots\right.}{}$$

$$+\frac{\sqrt{b}\left(\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\left((16a^2-15b^2)\cos\left(\frac{2a}{b}\right)-24ab\sin\left(\frac{2a}{b}\right)\right)+\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c\cdots}}{\sqrt{b}\sqrt{\pi}}\right.\right.}{}$$

```
[In] Integrate[x*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] -1/2*(a^2*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a +
 b*ArcSin[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/
b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d^2*E^((I*a)/b)*Sqrt[a + b*
ArcSin[c + d*x]]) - (a*Sqrt[b]*c*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*
Sqrt[1 - (c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a
/b]) + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]
]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(2*d^2) - (Sqrt[b]*c*(2*Sqrt[b]*Sqrt[a +
b*ArcSin[c + d*x]]*(-2*Sqrt[1 - (c + d*x)^2]*(a - 5*b*ArcSin[c + d*x]) + b*
(c + d*x)*(-15 + 4*ArcSin[c + d*x]^2)) - Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sq
rt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*((4*a^2 - 15*b^2)*Cos[a/b] - 12*a*b*Sin
[a/b]) + Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[
b]]*(12*a*b*Cos[a/b] + (4*a^2 - 15*b^2)*Sin[a/b])))/(8*d^2) + (a^2*(-2*Sqrt
[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt[Pi]*Cos[(2*a)
/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + Sqrt[b]*
Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(
2*a)/b]))/(8*d^2) + (a*Sqrt[b]*(-(Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c
```

```
+ d*x]])/(Sqrt[b]*Sqrt[Pi])]*(3*b*Cos[(2*a)/b] + 4*a*Sin[(2*a)/b])) - Sqrt[
Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*(4*a*Cos[(
2*a)/b] - 3*b*Sin[(2*a)/b]) + 2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(-4*Arc
Sin[c + d*x]*Cos[2*ArcSin[c + d*x]] + 3*Sin[2*ArcSin[c + d*x]])))/(16*d^2)
+ (Sqrt[b]*(Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt
[Pi])]*((16*a^2 - 15*b^2)*Cos[(2*a)/b] - 24*a*b*Sin[(2*a)/b]) + Sqrt[Pi]*Fr
esnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*(24*a*b*Cos[(2*a
)/b] + (16*a^2 - 15*b^2)*Sin[(2*a)/b]) + 2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*
x]]*(-(b*(-15 + 16*ArcSin[c + d*x]^2)*Cos[2*ArcSin[c + d*x]]) - 4*(a - 5*b*
ArcSin[c + d*x])*Sin[2*ArcSin[c + d*x]])))/(128*d^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 880 vs. $2(330) = 660$.

Time = 1.14 (sec) , antiderivative size = 881, normalized size of antiderivative = 2.17

method	result	size
default	Expression too large to display	881

```
[In] int(x*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/128/d^2/(a+b*arcsin(d*x+c))^(1/2)*(-240*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*b^3*c-240*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*b^3*c-128*arcsin(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b
)*b^3*c+15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fresn
elC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^3-15*(-1
/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/
Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^3+32*arcsin(d*x+c)^3*c
os(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-384*arcsin(d*x+c)^2*sin(-(a+b*arcsin
(d*x+c))/b+a/b)*a*b^2*c+320*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)
*b^3*c+96*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+40*arcs
in(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-384*arcsin(d*x+c)*sin(-
(a+b*arcsin(d*x+c))/b+a/b)*a^2*b*c+480*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c
))/b+a/b)*b^3*c+640*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^2*c+9
6*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-30*arcsin(d*x+c)*
cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+80*arcsin(d*x+c)*sin(-2*(a+b*arcsin
(d*x+c))/b+2*a/b)*a*b^2-128*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3*c+480*sin(-
(a+b*arcsin(d*x+c))/b+a/b)*a*b^2*c+320*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*
b*c+32*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^3-30*cos(-2*(a+b*arcsin(d*x+c)
)/b+2*a/b)*a*b^2+40*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b)
```

Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \int x(a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}\,dx$$

```
[In] integrate(x*(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{5}{2}}x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^(5/2)*x, x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.47 (sec) , antiderivative size = 2671, normalized size of antiderivative = 6.58

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] -1/256*(128*sqrt(2)*sqrt(pi)*a^3*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(
b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 128*sqrt(2)*sqrt
```

(pi)*a^3*b^2*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 384*I*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 384*I*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 128*I*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) + 128*I*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c)) - 384*I*sqrt(2)*sqrt(pi)*a^2*b*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 240*I*sqrt(2)*sqrt(pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 384*I*sqrt(2)*sqrt(pi)*a^2*b*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 240*I*sqrt(2)*sqrt(pi)*b^3*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 32*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(2*I*arcsin(d*x + c)) - 256*I*sqrt(b*arcsin(d*x + c) + a)*a*b*c*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 320*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 256*I*sqrt(b*arcsin(d*x + c) + a)*a*b*c*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 320*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 32*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c)) + 64*I*sqrt(pi)*a^3*b*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(3/2) + I*b^(5/2)/abs(b)) - 256*sqrt(pi)*a^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 256*sqrt(pi)*a^3*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 64*I*sqrt(pi)*a^3*b*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b^(3/2) - I*b^(5/2)/abs(b)) - 64*I*sqrt(pi)*a^3*sqrt(b)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b + I*b^2/abs(b)) + 96*sqrt(pi)*a^2*b^(3/2)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b + I*b^2/abs(b)) + 64*I*sqrt(pi)*a^3*sqrt(b)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^2/abs(b)) + 96*sqrt(pi)*a^2*b^(3/2)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^2/abs(b)) + 64*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(2*I*arcsin(d*x + c

```
)) + 40*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^(2*I*arcsin(d*x
 + c)) - 128*I*sqrt(b*arcsin(d*x + c) + a)*a^2*c*e^(I*arcsin(d*x + c)) + 32
0*sqrt(b*arcsin(d*x + c) + a)*a*b*c*e^(I*arcsin(d*x + c)) + 480*I*sqrt(b*ar
csin(d*x + c) + a)*b^2*c*e^(I*arcsin(d*x + c)) + 128*I*sqrt(b*arcsin(d*x +
c) + a)*a^2*c*e^(-I*arcsin(d*x + c)) + 320*sqrt(b*arcsin(d*x + c) + a)*a*b*
c*e^(-I*arcsin(d*x + c)) - 480*I*sqrt(b*arcsin(d*x + c) + a)*b^2*c*e^(-I*ar
csin(d*x + c)) + 64*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(-2*I
*arcsin(d*x + c)) - 40*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^
(-2*I*arcsin(d*x + c)) - 96*sqrt(pi)*a^2*b*erf(-sqrt(b*arcsin(d*x + c) + a)
/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(
b) + I*b^(3/2)/abs(b)) + 36*I*sqrt(pi)*a*b^2*erf(-sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqr
t(b) + I*b^(3/2)/abs(b)) - 64*I*sqrt(pi)*a^3*erf(-sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sq
rt(b) - I*b^(3/2)/abs(b)) - 96*sqrt(pi)*a^2*b*erf(-sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(s
qrt(b) - I*b^(3/2)/abs(b)) - 36*I*sqrt(pi)*a*b^2*erf(-sqrt(b*arcsin(d*x + c
) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)
/(sqrt(b) - I*b^(3/2)/abs(b)) - 36*I*sqrt(pi)*a*b^(3/2)*erf(-sqrt(b*arcsin(
d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*
I*a/b)/(I*b/abs(b) + 1) - 15*sqrt(pi)*b^(5/2)*erf(-sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*
b/abs(b) + 1) + 64*I*sqrt(pi)*a^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
+ I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b)*(-I*b
/abs(b) + 1)) + 36*I*sqrt(pi)*a*b^(3/2)*erf(-sqrt(b*arcsin(d*x + c) + a)/sq
rt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/ab
s(b) + 1) - 15*sqrt(pi)*b^(5/2)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) + 1
) + 32*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(2*I*arcsin(d*x + c)) + 40*I*sqrt(
b*arcsin(d*x + c) + a)*a*b*e^(2*I*arcsin(d*x + c)) - 30*sqrt(b*arcsin(d*x +
 c) + a)*b^2*e^(2*I*arcsin(d*x + c)) + 32*sqrt(b*arcsin(d*x + c) + a)*a^2*e
^(-2*I*arcsin(d*x + c)) - 40*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^(-2*I*arcs
in(d*x + c)) - 30*sqrt(b*arcsin(d*x + c) + a)*b^2*e^(-2*I*arcsin(d*x + c)))
/d^2
```

Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

```
[In] int(x*(a + b*asin(c + d*x))^(5/2),x)
[Out] int(x*(a + b*asin(c + d*x))^(5/2), x)
```

3.161 $\int (a+b\arcsin(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 204

$$\begin{aligned}\int (a+b\arcsin(c+dx))^{5/2}\,dx &= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} \\ &+ \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} \\ &+ \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} \\ &- \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}\end{aligned}$$

```
[Out] (d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d+15/8*b^(5/2)*cos(a/b)*FresnelS(2^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-15/8*b^(5/2)
*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1
/2)*Pi^(1/2)/d+5/2*b*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d-15/4*b
^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$, Rules used

$= \{4887, 4715, 4767, 4809, 3387, 3386, 3432, 3385, 3433\}$

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15\sqrt{\frac{\pi}{2}}b^{5/2}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{15\sqrt{\frac{\pi}{2}}b^{5/2}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-15*b^2*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/(4*d) + (5*b*Sqrt[1 - (c +
d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2))/(2*d) + ((c + d*x)*(a + b*ArcSin[c +
 d*x])^(5/2))/d + (15*b^(5/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*d) - (15*b^(5/2)*Sqrt[Pi/2]*FresnelC[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(4*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{5/2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} - \frac{(5b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d}$$

$$= \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} - \frac{(15b^2)\,\text{Subst}\left(\int \sqrt{a+b\arcsin(x)}\,dx, x, c+dx\right)}{4d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{(15b^3)\operatorname{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} - \frac{(15b^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{\left(15b^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d} - \frac{\left(15b^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{\left(15b^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d} - \frac{\left(15b^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.36 (sec) , antiderivative size = 419, normalized size of antiderivative = 2.05

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \frac{\sqrt{b} e^{-\frac{ia}{b}} \left(i(4a^2 + 15b^2) \left(-1 + e^{\frac{2ia}{b}}\right) \sqrt{2\pi} \sqrt{a + b \arcsin(c + dx)} \operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}} \sqrt{a+b \arcsin(c+dx)}}{\sqrt{b}}\right)\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[b]*(I*(4*a^2 + 15*b^2)*(-1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*A
rcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]
+ (4*a^2 + 15*b^2)*(1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c + d
*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 4*Sqrt[b]
*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(-15*b*(c + d*x) + 10*a*Sqrt[1 - c^2
- 2*c*d*x - d^2*x^2] + 2*(4*a*(c + d*x) + 5*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*
x^2])*ArcSin[c + d*x] + 4*b*(c + d*x)*ArcSin[c + d*x]^2) + 2*a^2*Sqrt[((-I)
*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] +
 2*a^2*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (I*(a
 + b*ArcSin[c + d*x]))/b])))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 440 vs. 2(164) = 328.

Time = 0.79 (sec) , antiderivative size = 441, normalized size of antiderivative = 2.16

method	result
default	$-\frac{15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b^3+15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d*(15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+15
*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+8*arcsin(d*x
+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3+24*arcsin(d*x+c)^2*sin(-(a+b*arcs
in(d*x+c))/b+a/b)*a*b^2-20*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*
b^3+24*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-30*arcsin(d*x+c)
*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-40*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+
```

```
c))/b+a/b)*a*b^2+8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-30*sin(-(a+b*arcsin(
d*x+c))/b+a/b)*a*b^2-20*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b)/(a+b*arcsin(
d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \int (a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**(5/2),x)
[Out] Integral((a + b*asin(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.27 (sec) , antiderivative size = 1279, normalized size of antiderivative = 6.27

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

[Out] 1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c))/d - sqrt(pi)*a^3*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - sqrt(pi)*a^3*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - I*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + I*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e^(I*arcsin(d*x + c))/d + 15/8*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(-I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e^(-I*arcsin(d*x + c))/d - 15/8*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^(-I*arcsin(d*x + c))/d

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(5/2),x)
[Out] int((a + b*asin(c + d*x))^(5/2), x)
```

3.162 $\int (a+b\arcsin(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 243

$$\begin{aligned}\int (a+b\arcsin(c+dx))^{7/2}\,dx =& -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\ & -\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} \\ & +\frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} \\ & +\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} \\ & +\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}\end{aligned}$$

```
[Out] -35/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d+(d*x+c)*(a+b*arcsin(d*x+c))^(
7/2)/d+105/16*b^(7/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/16*b^(7/2)*FresnelS(2^(1/2)/Pi^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/2*b*(a+b
*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/8*b^3*(1-(d*x+c)^2)^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$, Rules used = {4887, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$\begin{aligned}\int (a+b\arcsin(c+dx))^{7/2}\,dx = {} & \frac{105\sqrt{\frac{\pi}{2}}b^{7/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} \\ & + \frac{105\sqrt{\frac{\pi}{2}}b^{7/2}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} \\ & - \frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\ & - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} \\ & + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-105*b^3*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(8*d) - (35*b^
2*(c + d*x)*(a + b*ArcSin[c + d*x])^(3/2))/(4*d) + (7*b*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^(5/2))/(2*d) + ((c + d*x)*(a + b*ArcSin[c + d*x]
)^(7/2))/d + (105*b^(7/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]])/(8*d) + (105*b^(7/2)*Sqrt[Pi/2]*FresnelS[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(8*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{7/2}\,dx, x, c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} - \frac{(7b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d}\\
&= \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}\\
&\quad - \frac{(35b^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{4d}
\end{aligned}
$$

$$= -\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^3)\,\mathrm{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^4)\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^3)\,\mathrm{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{\left(105b^3\cos\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d} + \frac{\left(105b^3\sin\left(\frac{a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{\left(105b^3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8d} + \frac{\left(105b^3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.85 (sec) , antiderivative size = 545, normalized size of antiderivative = 2.24

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \frac{e^{-\frac{ia}{b}}\left(\sqrt{b}\left(8ia^3\left(-1+e^{\frac{2ia}{b}}\right)+105b^3\left(1+e^{\frac{2ia}{b}}\right)\right)\sqrt{\frac{\pi}{2}}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b}}{}\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (Sqrt[b]*((8*I)*a^3*(-1 + E^(((2*I)*a)/b)) + 105*b^3*(1 + E^(((2*I)*a)/b)))
*Sqrt[Pi/2]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*Arc
Sin[c + d*x]])/Sqrt[b]] + 2*b*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(7*(-10*
a*b*(c + d*x) + 4*a^2*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] - 15*b^2*Sqrt[1 - c
^2 - 2*c*d*x - d^2*x^2]) + (24*a^2*(c + d*x) - 70*b^2*(c + d*x) + 56*a*b*Sq
rt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + 4*b*(6*a*(c + d*x) + 7*b
```

```
*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x]^2 + 8*b^2*(c + d*x)*Arc
Sin[c + d*x]^3) + 4*a^3*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (
(-I)*(a + b*ArcSin[c + d*x]))/b] + 4*a^3*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*Arc
Sin[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]) + Sqrt[b]*Sqrt
[2*Pi]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]]*(4*a^3*(1 + E^(((2*I)*a)/b)) + 105*b^3*E^((I*a)/b)*Sin[a
/b]))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 615 vs. $2(197) = 394$.

Time = 0.77 (sec) , antiderivative size = 616, normalized size of antiderivative = 2.53

method	result
default	$-\frac{-105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^4+105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}}{}$

```
[In] int((a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/d*(-105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)/
Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4
+105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/
(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+16*arcsi
n(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+64*arcsin(d*x+c)^3*sin(-(a+b
*arcsin(d*x+c))/b+a/b)*a*b^3-56*arcsin(d*x+c)^3*cos(-(a+b*arcsin(d*x+c))/b+
a/b)*b^4+96*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-140*arc
sin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-168*arcsin(d*x+c)^2*cos(-(
a+b*arcsin(d*x+c))/b+a/b)*a*b^3+64*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b
+a/b)*a^3*b-280*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-168*arc
sin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+210*arcsin(d*x+c)*cos(-(
a+b*arcsin(d*x+c))/b+a/b)*b^4+16*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^4-140*si
n(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-56*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^
3*b+210*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.54 (sec) , antiderivative size = 2308, normalized size of antiderivative = 9.50

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] -1/32*(16*sqrt(2)*sqrt(pi)*a^4*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/(I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b))) + 16*sqrt(2)*sqrt(pi)*
a^4*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^4/sqrt(a
bs(b)) + b^3*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4*b^2*erf(-1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))
+ 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4
*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(
b)) + b^2*sqrt(abs(b))) - 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c
```

) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))
+ 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e^(I*arcsin(d*x +
c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e^(-I*arcsin(d
*x + c)) + 32*sqrt(2)*sqrt(pi)*a^4*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 128*I*sqrt(2)*sqrt(p
i)*a^3*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt
(abs(b)) + b*sqrt(abs(b))) - 72*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) +
32*sqrt(2)*sqrt(pi)*a^4*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a
/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 128*I*sqrt(2)*sqrt(pi)*a^3*b^2
*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b))
+ b*sqrt(abs(b))) - 72*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*s
qrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 48*I*sqr
t(b*arcsin(d*x + c) + a)*a*b^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) - 56
*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) -
48*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*arcsin(d*x + c)^2*e^(-I*arcsin(d*x +
c)) - 56*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^2*e^(-I*arcsin(d*
x + c)) + 96*I*sqrt(2)*sqrt(pi)*a^3*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 72*sqrt(2)*sqrt(pi)*a^2
*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b))
+ sqrt(abs(b))) + 105*sqrt(2)*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 96*I*sqrt(2)*sqrt
(pi)*a^3*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(
abs(b)) + sqrt(abs(b))) + 72*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 105*sq
rt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I
*b/sqrt(abs(b)) + sqrt(abs(b))) + 48*I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*ar
csin(d*x + c)*e^(I*arcsin(d*x + c)) - 112*sqrt(b*arcsin(d*x + c) + a)*a*b^2
*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) - 140*I*sqrt(b*arcsin(d*x + c) + a)*
b^3*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) - 48*I*sqrt(b*arcsin(d*x + c) + a
)*a^2*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) - 112*sqrt(b*arcsin(d*x + c)
+ a)*a*b^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 140*I*sqrt(b*arcsin(d*
x + c) + a)*b^3*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 32*sqrt(pi)*a^4*er

```
f(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)
) + sqrt(2)*sqrt(abs(b))) + 32*sqrt(pi)*a^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(
abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) +
16*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(I*arcsin(d*x + c)) - 56*sqrt(b*arcs
in(d*x + c) + a)*a^2*b*e^(I*arcsin(d*x + c)) - 140*I*sqrt(b*arcsin(d*x + c)
 + a)*a*b^2*e^(I*arcsin(d*x + c)) + 210*sqrt(b*arcsin(d*x + c) + a)*b^3*e^(
I*arcsin(d*x + c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(-I*arcsin(d*x
+ c)) - 56*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^(-I*arcsin(d*x + c)) + 140*I
*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^(-I*arcsin(d*x + c)) + 210*sqrt(b*arcs
in(d*x + c) + a)*b^3*e^(-I*arcsin(d*x + c)))/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(7/2),x)
[Out] int((a + b*asin(c + d*x))^(7/2), x)
```

3.163 $\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 440

$$\begin{aligned}\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx &= \frac{\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} \\ &+ \frac{c^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} \\ &- \frac{\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} \\ &- \frac{c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3} \\ &+ \frac{\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d^3} \\ &+ \frac{c^2\sqrt{2\pi}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^3} \\ &+ \frac{c\sqrt{\pi}\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{\sqrt{b}d^3} \\ &- \frac{\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d^3}\end{aligned}$$

```
[Out] -1/12*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2
))*6^(1/2)*Pi^(1/2)/d^3/b^(1/2)-1/12*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d^3/b^(1/2)+1/4*cos(a/b)
*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1
/2)/d^3/b^(1/2)+1/4*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(
1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^3/b^(1/2)-c*cos(2*a/b)*FresnelS(2*(a+b*ar
csin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d^3/b^(1/2)+c*FresnelC(2*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d^3/b^(1/2)+c^2
*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1
/2)*Pi^(1/2)/d^3/b^(1/2)+c^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^3/b^(1/2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4889, 4831, 6873, 6874, 3435, 3433, 3432, 3434, 4670}

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}c^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} + \frac{\sqrt{2\pi}c^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} + \frac{\sqrt{\pi}c\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3} + \frac{\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} - \frac{\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} + \frac{\sqrt{\frac{\pi}{2}}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} - \frac{\sqrt{\frac{\pi}{6}}\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} - \frac{\sqrt{\pi}c\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3}$$

```
[In] Int[x^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]])/(2*Sqrt[b]*d^3) + (c^2*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c + d*x]])/Sqrt[b]])/(Sqrt[b]*d^3) - (Sqrt[Pi/6]*Cos[(3*a)/b]*
FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(2*Sqrt[b]*d^3)
 - (c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[
b]*Sqrt[Pi])])/(Sqrt[b]*d^3) + (Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(2*Sqrt[b]*d^3) + (c^2*Sqrt[2*Pi]*Fres
nelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*d
^3) + (c*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi
])]*Sin[(2*a)/b])/(Sqrt[b]*d^3) - (Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*d^3)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 4670

```
Int[Cos[w_]^(q_.)*Sin[v_]^(p_.), x_Symbol] :> Int[ExpandTrigReduce[Sin[v]^p
*Cos[w]^q, x], x] /; IGtQ[p, 0] && IGtQ[q, 0] && ((PolynomialQ[v, x] && Pol
ynomialQ[w, x]) || (BinomialQ[{v, w}, x] && IndependentQ[Cancel[v/w], x]))
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\left(-\frac{c}{d}+\frac{x}{d}\right)^2}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)^2}{\sqrt{a+bx}}\,dx, x, \arcsin(c+dx)\right)}{d}$$

$$= \frac{2\text{Subst}\left(\int \cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)^2\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$= \frac{2\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)^2\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$= \frac{2\text{Subst}\left(\int \left(c^2\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+c\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)+\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin}\right.}{bd^3}$$

$$= \frac{2\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3} + \frac{(2c)\text{Subst}\left(\int \sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3} + \frac{(2c^2)\,\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$= \frac{2\text{Subst}\left(\int \left(-\frac{1}{4}\cos\left(\frac{3a}{b}-\frac{3x^2}{b}\right)+\frac{1}{4}\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$
$$+ \frac{\left(2c^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$
$$- \frac{\left(2c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$
$$+ \frac{\left(2c^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$
$$+ \frac{\left(2c\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^3}$$

$$= \frac{c^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3}$$
$$- \frac{c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3}$$
$$+ \frac{c^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^3}$$
$$+ \frac{c\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{\sqrt{b}d^3}$$
$$- \frac{\text{Subst}\left(\int \cos\left(\frac{3a}{b}-\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3}$$
$$+ \frac{\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3}$$

$$
\begin{aligned}
&= \frac{c^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} \\
&- \frac{c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3} \\
&+ \frac{c^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^3} \\
&+ \frac{c\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{\sqrt{b}d^3} \\
&+ \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3} \\
&- \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3} \\
&+ \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3} \\
&- \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd^3}
\end{aligned}
$$

$$= \frac{\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} + \frac{c^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} - \frac{\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} - \frac{c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3} + \frac{\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d^3} + \frac{c^2\sqrt{2\pi}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^3} + \frac{c\sqrt{\pi}\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{\sqrt{b}d^3} - \frac{\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d^3}$$

Mathematica [A] (verified)

Time = 2.34 (sec) , antiderivative size = 319, normalized size of antiderivative = 0.72

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{\pi}\left(3\sqrt{2}(1+4c^2)\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right) - \sqrt{6}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right) -$$

```
[In] Integrate[x^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (Sqrt[Pi]*(3*Sqrt[2]*(1 + 4*c^2)*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]] - Sqrt[6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[
a + b*ArcSin[c + d*x]])/Sqrt[b]] - 12*c*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b
*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + 3*Sqrt[2]*FresnelS[(Sqrt[2/Pi]*Sqr
t[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + 12*Sqrt[2]*c^2*FresnelS[(Sqrt
[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + 12*c*FresnelC[(2*Sq
```

```
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - Sqrt[6]*Fresn
elS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b]))/(12*Sq
rt[b]*d^3)
```

Maple [A] (verified)

Time = 1.10 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.87

method	result
default	$\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(12\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c^2-12\sqrt{2}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c^2+3\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{Fresnel}\right.$

```
[In] int(x^2/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/12/d^3*Pi^(1/2)*(-1/b)^(1/2)*(12*2^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c^2-12*2^(1/2)*sin(a/b)*Fresne
lS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c^2+3*2^(1/2)
*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)-3*2^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)+2^(1/2)*(-1/b)^(1/2)*(-3/b)^(1/2)*cos(3*a/b)*FresnelC(3*2^(1
/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-2^(1/2)*(-1/b)^(1/
2)*(-3/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*b+12*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c+12*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx$$

```
[In] integrate(x**2/(a+b*asin(d*x+c))**(1/2),x)
[Out] Integral(x**2/sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x^2}{\sqrt{b\arcsin\,(dx+c)+a}}\,dx$$

```
[In] integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(x^2/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 646, normalized size of antiderivative = 1.47

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= -\frac{\sqrt{\pi}c^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}c^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{\pi}c\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{2d^3\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)}$$
$$+\frac{i\sqrt{\pi}c\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{2\sqrt{b}d^3\left(\frac{ib}{|b|}+1\right)}$$
$$+\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d^3}$$
$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4d^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4d^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$+\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d^3}$$

```
[In] integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d^3*(I*
sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*c^2*erf(1/2*I*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^3*(-I*sqrt(2)*b/sqrt(abs(b)) +
sqrt(2)*sqrt(abs(b)))) - 1/2*I*sqrt(pi)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/
sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d^3*(
sqrt(b) - I*b^(3/2)/abs(b))) + 1/2*I*sqrt(pi)*c*erf(-sqrt(b*arcsin(d*x + c)
 + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(
sqrt(b)*d^3*(I*b/abs(b) + 1)) + 1/4*sqrt(pi)*erf(-1/2*sqrt(6)*sqrt(b*arcsin
```

```
(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(3*I*a/b)/((sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*d^3) - 1/
4*sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d^3*(I*sqr
t(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/4*sqrt(pi)*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^3*(-I*sqrt(2)*b/sqrt(abs(b)) + sqr
t(2)*sqrt(abs(b)))) + 1/4*sqrt(pi)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c)
+ a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^
(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b))*d^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{x^2}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

```
[In] int(x^2/(a + b*asin(c + d*x))^(1/2),x)
```

```
[Out] int(x^2/(a + b*asin(c + d*x))^(1/2), x)
```

3.164 $\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 211

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^2} + \frac{\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d^2} - \frac{c\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^2} - \frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d^2}$$

```
[Out] 1/2*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1
/2)/d^2/b^(1/2)-1/2*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*
sin(2*a/b)*Pi^(1/2)/d^2/b^(1/2)-c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2/b^(1/2)-c*FresnelS(2^(1/2
)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^2
/b^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4889, 4831, 6873, 6874, 3435, 3433, 3432, 3434}

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d^2} - \frac{\sqrt{2\pi}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^2} - \frac{\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^2} + \frac{\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d^2}$$

```
[In] Int[x/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] -((c*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/(Sqrt[b]*d^2)) + (Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*Ar
cSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(2*Sqrt[b]*d^2) - (c*Sqrt[2*Pi]*Fresne
lS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*d^2
) - (Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*
Sin[(2*a)/b])/(2*Sqrt[b]*d^2)
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3434

```
Int[Sin[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Sin[c], Int
[Cos[d*(e + f*x)^2], x], x] + Dist[Cos[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 3435

```
Int[Cos[(c_) + (d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Dist[Cos[c], Int
[Cos[d*(e + f*x)^2], x], x] - Dist[Sin[c], Int[Sin[d*(e + f*x)^2], x], x] /
; FreeQ[{c, d, e, f}, x]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{-\frac{c}{d}+\frac{x}{d}}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)}{\sqrt{a+bx}}\,dx, x, \arcsin(c+dx)\right)}{d}$$

$$= -\frac{2\text{Subst}\left(\int \cos\left(\frac{a-x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)\left(c+\sin\left(\frac{a-x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{2\text{Subst}\left(\int \left(c\cos\left(\frac{a}{b}-\frac{x^2}{b}\right)+\frac{1}{2}\sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{\text{Subst}\left(\int \sin\left(\frac{2a}{b}-\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} - \frac{(2c)\text{Subst}\left(\int \cos\left(\frac{a}{b}-\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{\left(2c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} - \frac{\left(2c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2} - \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd^2}$$

$$= -\frac{c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^2} + \frac{\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d^2} - \frac{c\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^2} - \frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.47 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.03

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= \frac{\frac{ice^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{\sqrt{a+b\arcsin(c+dx)}} + \frac{\sqrt{\pi}\left(\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(2\sqrt{\right.\right.}{}}{2d^2}$$

```
[In] Integrate[x/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((I*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSi
n[c + d*x]))/b] - E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma
[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d
*x]]) + (Sqrt[Pi]*(Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(S
qrt[b]*Sqrt[Pi])] - FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[
Pi])]*Sin[(2*a)/b]))/Sqrt[b])/(2*d^2)
```

Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.85

method	result
default	$-\frac{\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\left(2\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c-2\sqrt{2}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c+\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(2\sqrt{\right.}\right.}{2d^2}$

```
[In] int(x/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d^2*(-1/b)^(1/2)*Pi^(1/2)*(2*2^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2
)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c-2*2^(1/2)*sin(a/b)*FresnelS(2
^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c+cos(2*a/b)*Fres
nelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(2*a/b
)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx$$

```
[In] integrate(x/(a+b*asin(d*x+c))**(1/2),x)
```

```
[Out] Integral(x/sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(x/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.49 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.45

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{\pi}c\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d^2\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} + \frac{\sqrt{\pi}c\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d^2\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} + \frac{i\sqrt{\pi}\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4d^2\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} - \frac{i\sqrt{\pi}\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d^2\left(\frac{ib}{|b|}+1\right)}$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] sqrt(pi)*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d^2*(I*sqr
t(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + sqrt(pi)*c*erf(1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^2*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(
2)*sqrt(abs(b)))) + 1/4*I*sqrt(pi)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d^2*(sqrt(b)
 - I*b^(3/2)/abs(b))) - 1/4*I*sqrt(pi)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d
^2*(I*b/abs(b) + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

```
[In] int(x/(a + b*asin(c + d*x))^(1/2),x)
[Out] int(x/(a + b*asin(c + d*x))^(1/2), x)
```

3.165 $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 105

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

```
[Out] cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/
2)*Pi^(1/2)/d/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d}$$

```
[In] Int[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]])/(Sqrt[b]*d) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
d*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$
$$= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}$$
$$= \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd}$$
$$= \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.13 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.25

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2}, -\frac{i(a+b\arcsin(c+dx))}{b}\right) + e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2}, \frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*Ar
cSin[c + d*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d*E^((I*a)/b)*Sqrt[a + b*ArcSin
[c + d*x]])
```

Maple [A] (verified)

Time = 0.53 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.90

method	result	size
default	$\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\left(\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\right)}{d}$	94

```
[In] int(1/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^
(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\arcsin\left(dx+c\right)+a}}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")

[Out] integrate(1/sqrt(b*arcsin(d*x + c) + a), x)

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.59

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")

[Out] -sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))))

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

[In] int(1/(a + b*asin(c + d*x))^(1/2),x)

[Out] int(1/(a + b*asin(c + d*x))^(1/2), x)

3.166 $\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 287

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} + \frac{2c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d^2} - \frac{2c\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d^2} + \frac{2\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d^2}$$

```
[Out] 2*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2
)/b^(3/2)/d^2+2*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(
2*a/b)*Pi^(1/2)/b^(3/2)/d^2+2*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d^2-2*c*FresnelC(2^(1/2
)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(
3/2)/d^2+2*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(1/2)-2*(d*x+c)*
(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4889, 4829, 4717, 4809, 3387, 3386, 3432, 3385, 3433, 4727}

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d^2} + \frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} + \frac{2\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} + \frac{2\sqrt{2\pi}c\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d^2} + \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[x/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (2*c*Sqrt[1 - (c + d*x)^2])/(b*d^2*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(c + d
*x)*Sqrt[1 - (c + d*x)^2])/(b*d^2*Sqrt[a + b*ArcSin[c + d*x]]) + (2*Sqrt[Pi
]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]
)/(b^(3/2)*d^2) + (2*c*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]])/(b^(3/2)*d^2) - (2*c*Sqrt[2*Pi]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*d^2) + (2*Sq
rt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*
a)/b])/(b^(3/2)*d^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
```

```
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{-\frac{c}{d}+\frac{x}{d}}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \left(-\frac{c}{d(a+b\arcsin(x))^{3/2}}+\frac{x}{d(a+b\arcsin(x))^{3/2}}\right)\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d^2} - \frac{c\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{2\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2} + \frac{(2c)\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{bd^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{(2c)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2} + \frac{\left(2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2} + \frac{\left(2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(2c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2} + \frac{\left(4\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d^2} - \frac{\left(2c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d^2} + \frac{\left(4\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} + \frac{2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d^2} + \frac{\left(4c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d^2} - \frac{\left(4c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} + \frac{2c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d^2} - \frac{2c\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d^2} + \frac{2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d^2}$$

Mathematica [A] (verified)

Time = 4.14 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.87

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\frac{2\sqrt{b}c\sqrt{1-(c+dx)^2}}{\sqrt{a+b\arcsin(c+dx)}} + 2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right) + 2c\sqrt{2\pi}\cos\left(\frac{a}{b}\right.}{}$$

```
[In] Integrate[x/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] ((2*Sqrt[b]*c*Sqrt[1 - (c + d*x)^2])/Sqrt[a + b*ArcSin[c + d*x]] + 2*Sqrt[P
i]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])
] + 2*c*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]
])/Sqrt[b]] - 2*c*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[a/b] + 2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])
/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - (Sqrt[b]*Sin[2*ArcSin[c + d*x]])/Sqrt[a
 + b*ArcSin[c + d*x]])/(b^(3/2)*d^2)
```

Maple [A] (verified)

Time = 1.01 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.12

method	result
default	$\frac{-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}}{}$

```
[In] int(x/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d^2/b/(a+b*arcsin(d*x+c))^(1/2)*(-2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b)*c-2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)/b)*c+2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fres
nelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2*(-1/b)^
(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(
1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+2*cos(-(a+b*arcsin(d*x+c))/b
+a/b)*c+sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}\,(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x/(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] Integral(x/(a + b*asin(c + d*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}(c+d\,x))^{3/2}}\,dx$$

```
[In] int(x/(a + b*asin(c + d*x))^(3/2),x)
[Out] int(x/(a + b*asin(c + d*x))^(3/2), x)
```

3.167 $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 144

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}$$

```
[Out] -2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^
(1/2)*Pi^(1/2)/b^(3/2)/d+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d-2*(1-(d*x+c)^2)^(1/2)/b/d/
(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4887, 4717, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{2\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}$$

[In] Int[(a + b*ArcSin[c + d*x])^(-3/2),x]

[Out] (-2*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]) - (2*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(b^(3/2)*d) + (2*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*d)

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)), Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
```

```
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{bd}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}\\
&\quad + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}\\
&\quad - \frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}\\
&\quad + \frac{\left(4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d}\\
&\quad + \frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.23 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.28

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(e^{i\arcsin(c+dx)}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+\right.}{bd\sqrt{a+}}$$

[In] Integrate[(a + b*ArcSin[c + d*x])^(-3/2),x]

[Out] (E^(I*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c + d*x]) + E^((I*(a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(b*d*E^((I*(a + b*ArcSin[c + d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])

Maple [A] (verified)

Time = 0.72 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.18

method	result
default	$-\frac{2\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\,\mathrm{ar}}}{\sqrt{\pi}\,\sqrt{}}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$

[In] int(1/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)

[Out] -2/d/b/(a+b*arcsin(d*x+c))^(1/2)*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(-(a+b*arcsin(d*x+c))/b+a/b))

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}{(c+dx)})^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(3/2),x)
[Out] Integral((a + b*asin(c + d*x))**(-3/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}{(c+d\,x)})^{3/2}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(3/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(3/2), x)
```

3.168 $\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 384

$$
\begin{aligned}
\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} \\
&- \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} \\
&- \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} \\
&+ \frac{4c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2} \\
&- \frac{8\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d^2} \\
&+ \frac{4c\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d^2} \\
&+ \frac{8\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d^2}
\end{aligned}
$$

```
[Out] -8/3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(
1/2)/b^(5/2)/d^2+8/3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))
*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d^2+4/3*c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d^2+4/3*c*Fresne
lS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^
(1/2)/b^(5/2)/d^2+2/3*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(3/2)
-2/3*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(3/2)-4/3/b^2/d^
```

```
2/(a+b*arcsin(d*x+c))^(1/2)-4/3*c*(d*x+c)/b^2/d^2/(a+b*arcsin(d*x+c))^(1/2)
+8/3*(d*x+c)^2/b^2/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.938, Rules used = {4889, 4829, 4717, 4807, 4719, 3387, 3386, 3432, 3385, 3433, 4729, 4731, 4491, 12, 4737}

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx=\frac{8\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d^2}+\frac{4\sqrt{2\pi}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2}+\frac{4\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2}-\frac{8\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d^2}+\frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}}-\frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}}-\frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3bd^2(a+b\arcsin(c+dx))^{3/2}}+\frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[x/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (2*c*Sqrt[1 - (c + d*x)^2])/(3*b*d^2*(a + b*ArcSin[c + d*x])^(3/2)) - (2*(c
 + d*x)*Sqrt[1 - (c + d*x)^2])/(3*b*d^2*(a + b*ArcSin[c + d*x])^(3/2)) - 4/
(3*b^2*d^2*Sqrt[a + b*ArcSin[c + d*x]]) - (4*c*(c + d*x))/(3*b^2*d^2*Sqrt[a
 + b*ArcSin[c + d*x]]) + (8*(c + d*x)^2)/(3*b^2*d^2*Sqrt[a + b*ArcSin[c + d
*x]]) + (4*c*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
 d*x]])/Sqrt[b]])/(3*b^(5/2)*d^2) - (8*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(3*b^(5/2)*d^2) + (4*c*Sqrt
[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])
/(3*b^(5/2)*d^2) + (8*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sq
rt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(3*b^(5/2)*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{-\frac{c}{d}+\frac{x}{d}}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \left(-\frac{c}{d(a+b\arcsin(x))^{5/2}}+\frac{x}{d(a+b\arcsin(x))^{5/2}}\right)\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d^2} - \frac{c\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} + \frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd^2} - \frac{4\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd^2} + \frac{(2c)\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{16\text{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d^2} + \frac{(4c)\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{16\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2} + \frac{(4c)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{16\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2} + \frac{\left(4c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2} + \frac{\left(4c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2} + \frac{\left(8c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d^2} + \frac{\left(8c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{4c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2} + \frac{4c\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d^2} - \frac{\left(8\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2} + \frac{\left(8\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{4c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2} + \frac{4c\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d^2} - \frac{\left(16\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d^2} + \frac{\left(16\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{4c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2} - \frac{8\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d^2} + \frac{4c\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d^2} + \frac{8\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d^2}$$

Mathematica [A] (verified)

Time = 6.29 (sec) , antiderivative size = 388, normalized size of antiderivative = 1.01

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{4a\sqrt{b}c^2 + 4a\sqrt{b}cdx - 2b^{3/2}c\sqrt{1-(c+dx)^2} + 4b^{3/2}c^2\arcsin(c+dx) + 4b^{3/2}cdx\arcsin(c+dx) + 4a\sqrt{b}\cos}{}$$

```
[In] Integrate[x/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] -1/3*(4*a*Sqrt[b]*c^2 + 4*a*Sqrt[b]*c*d*x - 2*b^(3/2)*c*Sqrt[1 - (c + d*x)^
2] + 4*b^(3/2)*c^2*ArcSin[c + d*x] + 4*b^(3/2)*c*d*x*ArcSin[c + d*x] + 4*a*
Sqrt[b]*Cos[2*ArcSin[c + d*x]] + 4*b^(3/2)*ArcSin[c + d*x]*Cos[2*ArcSin[c +
 d*x]] - 4*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(3/2)*Cos[a/b]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 8*Sqrt[Pi]*(a + b*ArcSin[c
 + d*x])^(3/2)*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[
b]*Sqrt[Pi])] - 4*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(3/2)*FresnelS[(Sqrt
[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] - 8*Sqrt[Pi]*(a + b*A
rcSin[c + d*x])^(3/2)*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqr
t[Pi])]*Sin[(2*a)/b] + b^(3/2)*Sin[2*ArcSin[c + d*x]])/(b^(5/2)*d^2*(a + b*
ArcSin[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 724 vs. $2(312) = 624$.

Time = 1.16 (sec) , antiderivative size = 725, normalized size of antiderivative = 1.89

method	result
default	$\frac{4 \arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\ \mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{a}{b}\right)bc-4\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\,\mathrm{ar}}}{}$

```
[In] int(x/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3/d^2/b^2*(4*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*cos(a/b)*b*c-4*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*b*c+4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*cos(a
/b)*a*c-4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*c+8*a
rcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fre
snelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+8*arcs
in(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*Fresne
lC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+8*(-1/b)^
(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(
1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+8*(-1/b)^(1/2)*Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*a+4*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+
a/b)*b*c-4*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+2*cos(-(a+b*
arcsin(d*x+c))/b+a/b)*b*c+4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*c+sin(-2*(a+b
*arcsin(d*x+c))/b+2*a/b)*b-4*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a)/(a+b*ar
csin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}\,(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x/(a+b*asin(d*x+c))**(5/2),x)
[Out] Integral(x/(a + b*asin(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(x/(a + b*asin(c + d*x))^(5/2),x)
[Out] int(x/(a + b*asin(c + d*x))^(5/2), x)
```

3.169 $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 179

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx=-\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}+\frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}}-\frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d}-\frac{4\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}$$

```
[Out] -4/3*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*
2^(1/2)*Pi^(1/2)/b^(5/2)/d-4/3*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*(1-(d*x+c)^2)^(1/2
)/b/d/(a+b*arcsin(d*x+c))^(3/2)+4/3*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used

$= \{4887, 4717, 4807, 4719, 3387, 3386, 3432, 3385, 3433\}$

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

```
[Out] (-2*Sqrt[1 - (c + d*x)^2])/(3*b*d*(a + b*ArcSin[c + d*x])^(3/2)) + (4*(c +
d*x))/(3*b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) - (4*Sqrt[2*Pi]*Cos[a/b]*Fresne
lC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(3*b^(5/2)*d) - (4*Sq
rt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b
])/(3*b^(5/2)*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd} \\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad - \frac{4\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d} \\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad - \frac{4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}
\end{aligned}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(4\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} - \frac{\left(4\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(8\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} - \frac{\left(8\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.33

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(-2be^{i\arcsin(c+dx)}\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{3/2}\Gamma\left(\frac{1}{2}, -\frac{i(a+b\arcsin(c\ldots}{b}\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

```
[Out] (-2*b*E^(I*ArcSin[c + d*x])*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[
1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - I*E^((I*a)/b)*(2*a*(-1 + E^((2*I)*
ArcSin[c + d*x])) + b*(-I - 2*ArcSin[c + d*x] + E^((2*I)*ArcSin[c + d*x])*(
-I + 2*ArcSin[c + d*x])) - (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((I*(a
 + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))
/(3*b^2*d*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. $2(145) = 290$.

Time = 0.74 (sec) , antiderivative size = 370, normalized size of antiderivative = 2.07

method	result
default	$-\frac{2\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\right.}{}$

```
[In] int(1/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-
1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin
(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(
-1/b)^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(a/b)*Fresnel
C(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a
-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a+2*arcsin(d*x
+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*s
in(-(a+b*arcsin(d*x+c))/b+a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-5/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(5/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(5/2), x)
```

3.170 $\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 468

$$\begin{aligned}\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx &= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} \\ &- \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2} \\ &- \frac{8c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d^2} \\ &+ \frac{8c\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d^2} \\ &- \frac{32\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d^2}\end{aligned}$$

```
[Out] -4/15/b^2/d^2/(a+b*arcsin(d*x+c))^(3/2)-4/15*c*(d*x+c)/b^2/d^2/(a+b*arcsin(
d*x+c))^(3/2)+8/15*(d*x+c)^2/b^2/d^2/(a+b*arcsin(d*x+c))^(3/2)-32/15*cos(2*
a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(7/2
)/d^2-32/15*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/
b)*Pi^(1/2)/b^(7/2)/d^2-8/15*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcs
```

```
in(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d^2+8/15*c*FresnelC(2^(1
/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b
^(7/2)/d^2+2/5*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(5/2)-2/5*(d
*x+c)*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(5/2)-8/15*c*(1-(d*x+c)
^2)^(1/2)/b^3/d^2/(a+b*arcsin(d*x+c))^(1/2)+32/15*(d*x+c)*(1-(d*x+c)^2)^(1/
2)/b^3/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 468, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.812$, Rules used = {4889, 4829, 4717, 4807, 4809, 3387, 3386, 3432, 3385, 3433, 4729, 4727, 4737}

$$\begin{aligned}\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = &\frac{8\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d^2}\\
&-\frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2}\\
&-\frac{32\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2}\\
&-\frac{8\sqrt{2\pi}c\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d^2}+\frac{32\sqrt{1-(c+dx)^2}(c+dx)}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}}\\
&-\frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}}+\frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}\\
&-\frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}-\frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}\\
&-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{5bd^2(a+b\arcsin(c+dx))^{5/2}}+\frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}}\end{aligned}$$

```
[In] Int[x/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (2*c*Sqrt[1 - (c + d*x)^2])/(5*b*d^2*(a + b*ArcSin[c + d*x])^(5/2)) - (2*(c
 + d*x)*Sqrt[1 - (c + d*x)^2])/(5*b*d^2*(a + b*ArcSin[c + d*x])^(5/2)) - 4/
(15*b^2*d^2*(a + b*ArcSin[c + d*x])^(3/2)) - (4*c*(c + d*x))/(15*b^2*d^2*(a
 + b*ArcSin[c + d*x])^(3/2)) + (8*(c + d*x)^2)/(15*b^2*d^2*(a + b*ArcSin[c
+ d*x])^(3/2)) - (8*c*Sqrt[1 - (c + d*x)^2])/(15*b^3*d^2*Sqrt[a + b*ArcSin[
c + d*x]]) + (32*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(15*b^3*d^2*Sqrt[a + b*Ar
cSin[c + d*x]]) - (32*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c
 + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(15*b^(7/2)*d^2) - (8*c*Sqrt[2*Pi]*Cos[a/b]*
FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(15*b^(7/2)*d^2
) + (8*c*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[
```

```
b]]*Sin[a/b])/(15*b^(7/2)*d^2) - (32*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin
[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(15*b^(7/2)*d^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4829

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{-\frac{c}{d}+\frac{x}{d}}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \left(-\frac{c}{d(a+b\arcsin(x))^{7/2}}+\frac{x}{d(a+b\arcsin(x))^{7/2}}\right)\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d^2} - \frac{c\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} + \frac{2\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd^2} - \frac{4\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd^2} + \frac{(2c)\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{16\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{15b^2d^2} + \frac{(4c)\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{15b^2d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{32\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2} - \frac{(8c)\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{15b^3d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}}$$
$$- \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}$$
$$- \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}$$
$$- \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}}$$
$$+ \frac{(8c)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2}$$
$$- \frac{\left(32\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2}$$
$$- \frac{\left(32\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}}$$
$$- \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}$$
$$- \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}}$$
$$- \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}}$$
$$- \frac{\left(8c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2}$$
$$- \frac{\left(64\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d^2}$$
$$+ \frac{\left(8c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d^2}$$
$$- \frac{\left(64\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2} - \frac{32\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d^2} - \frac{\left(16c\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d^2} + \frac{\left(16c\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d^2}$$

$$= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} - \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} - \frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2} - \frac{8c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d^2} + \frac{8c\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d^2} - \frac{32\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d^2}$$

Mathematica [A] (verified)

Time = 5.38 (sec) , antiderivative size = 521, normalized size of antiderivative = 1.11

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx =$$

$$-\frac{4ab^{3/2}c(c+dx)+8a^2\sqrt{b}c\sqrt{1-(c+dx)^2}-6b^{5/2}c\sqrt{1-(c+dx)^2}+4b^{5/2}c(c+dx)\arcsin(c+dx)+16ab}{}$$

```
[In] Integrate[x/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] -1/15*(4*a*b^(3/2)*c*(c + d*x) + 8*a^2*Sqrt[b]*c*Sqrt[1 - (c + d*x)^2] - 6*
b^(5/2)*c*Sqrt[1 - (c + d*x)^2] + 4*b^(5/2)*c*(c + d*x)*ArcSin[c + d*x] + 1
6*a*b^(3/2)*c*Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x] + 8*b^(5/2)*c*Sqrt[1 -
(c + d*x)^2]*ArcSin[c + d*x]^2 + 4*a*b^(3/2)*Cos[2*ArcSin[c + d*x]] + 4*b^(
5/2)*ArcSin[c + d*x]*Cos[2*ArcSin[c + d*x]] + 32*Sqrt[Pi]*(a + b*ArcSin[c +
 d*x])^(5/2)*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]
*Sqrt[Pi])] + 8*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(5/2)*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] - 8*c*Sqrt[2*Pi]*(a + b
*ArcSin[c + d*x])^(5/2)*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/S
qrt[b]]*Sin[a/b] + 32*Sqrt[Pi]*(a + b*ArcSin[c + d*x])^(5/2)*FresnelS[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - 16*a^2*Sqrt[b
]*Sin[2*ArcSin[c + d*x]] + 3*b^(5/2)*Sin[2*ArcSin[c + d*x]] - 32*a*b^(3/2)*
ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] - 16*b^(5/2)*ArcSin[c + d*x]^2*Sin[2
*ArcSin[c + d*x]])/(b^(7/2)*d^2*(a + b*ArcSin[c + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1237 vs. 2(384) = 768.

Time = 1.18 (sec) , antiderivative size = 1238, normalized size of antiderivative = 2.65

method	result	size
default	Expression too large to display	1238

```
[In] int(x/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15/d^2/b^3/(a+b*arcsin(d*x+c))^(5/2)*(-8*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi
^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)
/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2*c-8*arcsin(d*x+c)^2*(-1/b)^(
1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/P
i^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2*c-16*arcsin(d*x+c)*(-
1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b*c-16*arcsin(d*x
```

```
+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*Fresne
lC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b*c+32*arcs
in(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fres
nelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-32*ar
csin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*Fr
esnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-8*(
-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2*c-8*(-1/b)^(1/
2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2*c+64*arcsin(d*x+c)*(-1/
b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/P
i^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b-64*arcsin(d*x+c)*(-1/
b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/P
i^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b+32*(-1/b)^(1/2)*Pi^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2-32*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*a^2+8*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)
*b^2*c+16*arcsin(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+16*arcsin
(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b*c-4*arcsin(d*x+c)*sin(-(a+b*arc
sin(d*x+c))/b+a/b)*b^2*c+32*arcsin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/
b)*a*b+4*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+8*cos(-(a+b*
arcsin(d*x+c))/b+a/b)*a^2*c-6*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2*c-4*sin(-
(a+b*arcsin(d*x+c))/b+a/b)*a*b*c+16*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2
-3*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+4*cos(-2*(a+b*arcsin(d*x+c))/b+2
*a/b)*a*b)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

```
[In] integrate(x/(a+b*asin(d*x+c))**(7/2),x)
[Out] Integral(x/(a + b*asin(c + d*x))**(7/2), x)
```

Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(x/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(a+b\operatorname{asin}(c+d\,x))^{7/2}}\,dx$$

```
[In] int(x/(a + b*asin(c + d*x))^(7/2),x)
[Out] int(x/(a + b*asin(c + d*x))^(7/2), x)
```

3.171 $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 218

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{8\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}$$

```
[Out] 4/15*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*cos(a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-8/1
5*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(
1/2)*Pi^(1/2)/b^(7/2)/d-2/5*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/
2)+8/15*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$, Rules used = {4887, 4717, 4807, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{8\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

```
[Out] (-2*Sqrt[1 - (c + d*x)^2])/(5*b*d*(a + b*ArcSin[c + d*x])^(5/2)) + (4*(c +
d*x))/(15*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (8*Sqrt[1 - (c + d*x)^2])/
(15*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) + (8*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(S
qrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(15*b^(7/2)*d) - (8*Sqrt[2
*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(
15*b^(7/2)*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{4\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{15b^2d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{15b^3d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{8\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(8\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d} - \frac{\left(8\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(16\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} - \frac{\left(16\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{8\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.32

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{-6b^2e^{i\arcsin(c+dx)} + 4e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(a+b\arcsin(c+dx))}{b}}(2a+b(-i\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

```
[Out] (-6*b^2*E^(I*ArcSin[c + d*x]) + (4*(a + b*ArcSin[c + d*x])*(E^((I*(a + b*Ar
cSin[c + d*x]))/b)*(2*a + b*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*(((-I)*(a +
 b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b])
)/E^((I*a)/b) + (8*a^2 + 4*a*b*(I + 4*ArcSin[c + d*x]) + 2*b^2*(-3 + (2*I)*
ArcSin[c + d*x] + 4*ArcSin[c + d*x]^2) - 8*E^((I*(a + b*ArcSin[c + d*x]))/b
)*(a + b*ArcSin[c + d*x])^2*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2,
(I*(a + b*ArcSin[c + d*x]))/b])/E^(I*ArcSin[c + d*x]))/(30*b^3*d*(a + b*Arc
Sin[c + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 623 vs. 2(178) = 356.

Time = 0.78 (sec) , antiderivative size = 624, normalized size of antiderivative = 2.86

method	result
default	$-\frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b^2}{15} - \frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\text{Fresne}}{15}$

```
[In] int(1/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/15/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)
```

```
*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^
(1/2)*(-1/b)^(1/2)*b^2-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*F
resnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*
Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/
2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-4*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)
*(-1/b)^(1/2)*a^2-4*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/
2)*a^2+4*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c
)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+
c))/b+a/b)*b^2+4*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-3*cos(-(a+b*arcsin(d*x
+c))/b+a/b)*b^2-2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b*arcsin(d*x+c))^
(5/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-7/2), x)
```

Maxima [F]

$$\int \frac{1}{(a + b \arcsin(c + dx))^{7/2}} \, dx = \int \frac{1}{(b \arcsin(dx + c) + a)^{\frac{7}{2}}} \, dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

Giac [F]

$$\int \frac{1}{(a + b \arcsin(c + dx))^{7/2}} \, dx = \int \frac{1}{(b \arcsin(dx + c) + a)^{\frac{7}{2}}} \, dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a + b \arcsin(c + dx))^{7/2}} \, dx = \int \frac{1}{(a + b \operatorname{asin}(c + d x))^{7/2}} \, dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(7/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(7/2), x)
```

3.172 $\int x^m(a+b\arcsin(c+dx))^n\,dx$

Optimal result

Integrand size = 16, antiderivative size = 16

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\text{Int}(x^m(a+b\arcsin(c+dx))^n,x)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(d*x+c))^n,x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int x^m(a+b\arcsin(c+dx))^n\,dx$$

```
[In] Int[x^m*(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] Defer[Subst][Defer[Int][(-(c/d) + x/d)^m*(a + b*ArcSin[x])^n, x], x, c + d*
x]/d
```

Rubi steps

$$\text{integral}=\frac{\text{Subst}\left(\int\left(-\frac{c}{d}+\frac{x}{d}\right)^m(a+b\arcsin(x))^n\,dx,x,c+dx\right)}{d}$$

Mathematica [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int x^m(a+b\arcsin(c+dx))^n\,dx$$

```
[In] Integrate[x^m*(a + b*ArcSin[c + d*x])^n,x]
[Out] Integrate[x^m*(a + b*ArcSin[c + d*x])^n, x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.49 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int x^m(a+b\arcsin(dx+c))^n\,dx$$

```
[In] int(x^m*(a+b*arcsin(d*x+c))^n,x)
[Out] int(x^m*(a+b*arcsin(d*x+c))^n,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x^m\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x + c) + a)^n*x^m, x)
```

Sympy [N/A]

Not integrable

Time = 18.79 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.94

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int x^m(a+b\operatorname{asin}(c+dx))^n\,dx$$

```
[In] integrate(x**m*(a+b*asin(d*x+c))**n,x)
[Out] Integral(x**m*(a + b*asin(c + d*x))**n, x)
```

Maxima [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^nx^m\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^n*x^m, x)
```

Giac [F(-1)]

Timed out.

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\text{Timed out}$$

```
[In] integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
[Out] Timed out
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int x^m\,(a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

```
[In] int(x^m*(a + b*asin(c + d*x))^n,x)
[Out] int(x^m*(a + b*asin(c + d*x))^n, x)
```

3.173 $\int x^2(a+b\arcsin(c+dx))^n\,dx$

Optimal result

Integrand size = 16, antiderivative size = 611

$$
\begin{aligned}
\int x^2(a+b\arcsin(c+dx))^n\,dx
&= -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&-\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}\\
&+\frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}\\
&+\frac{2^{-2-n}ce^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}\\
&+\frac{2^{-2-n}ce^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}\\
&+\frac{i3^{-1-n}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&-\frac{i3^{-1-n}e^{\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}
\end{aligned}
$$

```
[Out] -1/8*I*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d^3/exp(I*
a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/2*I*c^2*(a+b*arcsin(d*x+c))^n*GAMMA(1
+n,-I*(a+b*arcsin(d*x+c))/b)/d^3/exp(I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)+
```

```
1/8*I*exp(I*a/b)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d
^3/((I*(a+b*arcsin(d*x+c))/b)^n)+1/2*I*c^2*exp(I*a/b)*(a+b*arcsin(d*x+c))^n
*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d^3/((I*(a+b*arcsin(d*x+c))/b)^n)+2^(-2
-n)*c*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-2*I*(a+b*arcsin(d*x+c))/b)/d^3/exp(2
*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)+2^(-2-n)*c*exp(2*I*a/b)*(a+b*arcsin(
d*x+c))^n*GAMMA(1+n,2*I*(a+b*arcsin(d*x+c))/b)/d^3/((I*(a+b*arcsin(d*x+c))/
b)^n)+1/8*I*3^(-1-n)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-3*I*(a+b*arcsin(d*x+c
))/b)/d^3/exp(3*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/8*I*3^(-1-n)*exp(3*
I*a/b)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,3*I*(a+b*arcsin(d*x+c))/b)/d^3/((I*(
a+b*arcsin(d*x+c))/b)^n)
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 611, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {4889, 4831, 6873, 12, 6874, 3388, 2212, 4491, 3389}

$$\int x^2(a+b\arcsin(c+dx))^n\,dx$$
$$= -\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$-\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}$$
$$+\frac{c2^{-n-2}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}$$
$$+\frac{i3^{-n-1}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}$$
$$+\frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}$$
$$+\frac{c2^{-n-2}e^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}$$
$$-\frac{i3^{-n-1}e^{\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}$$

```
[In] Int[x^2*(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] ((-1/8*I)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*
x]))/b])/(d^3*E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) - ((I/2)*c^
```

```
2*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*x]))/b])
/(d^3*E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/8)*E^((I*a)/b
)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]))/b])/(d
^3*((I*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/2)*c^2*E^((I*a)/b)*(a + b*ArcSi
n[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]))/b])/(d^3*((I*(a + b*
ArcSin[c + d*x]))/b)^n) + (2^(-2 - n)*c*(a + b*ArcSin[c + d*x])^n*Gamma[1 +
 n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/(d^3*E^(((2*I)*a)/b)*(((-I)*(a + b
*ArcSin[c + d*x]))/b)^n) + (2^(-2 - n)*c*E^(((2*I)*a)/b)*(a + b*ArcSin[c +
d*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c + d*x]))/b])/(d^3*((I*(a + b*Ar
cSin[c + d*x]))/b)^n) + ((I/8)*3^(-1 - n)*(a + b*ArcSin[c + d*x])^n*Gamma[1
 + n, ((-3*I)*(a + b*ArcSin[c + d*x]))/b])/(d^3*E^(((3*I)*a)/b)*(((-I)*(a +
 b*ArcSin[c + d*x]))/b)^n) - ((I/8)*3^(-1 - n)*E^(((3*I)*a)/b)*(a + b*ArcSi
n[c + d*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c + d*x]))/b])/(d^3*((I*(a
+ b*ArcSin[c + d*x]))/b)^n)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)^2 (a+b\arcsin(x))^n\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n \cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)^2\,dx, x, \arcsin(c+dx)\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+bx)^n\cos(x)(c-\sin(x))^2}{d^2}\,dx, x, \arcsin(c+dx)\right)}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n \cos(x)(c-\sin(x))^2\,dx, x, \arcsin(c+dx)\right)}{d^3}$$

$$= \frac{\text{Subst}\left(\int \left(c^2(a+bx)^n\cos(x)-2c(a+bx)^n\cos(x)\sin(x)+(a+bx)^n\cos(x)\sin^2(x)\right)\,dx, x, \arcsin(\right.}{d^3}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n \cos(x)\sin^2(x)\,dx, x, \arcsin(c+dx)\right)}{d^3} - \frac{(2c)\text{Subst}\left(\int (a+bx)^n\cos(x)\sin(x)\,dx, x, \arcsin(c+dx)\right)}{d^3} + \frac{c^2\text{Subst}\left(\int (a+bx)^n\cos(x)\,dx, x, \arcsin(c+dx)\right)}{d^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{4}(a+bx)^n\cos(x)-\frac{1}{4}(a+bx)^n\cos(3x)\right)\,dx,x,\arcsin(c+dx)\right)}{d^3}$$
$$-\frac{(2c)\text{Subst}\left(\int \frac{1}{2}(a+bx)^n\sin(2x)\,dx,x,\arcsin(c+dx)\right)}{d^3}$$
$$+\frac{c^2\text{Subst}\left(\int e^{-ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{2d^3}$$
$$+\frac{c^2\text{Subst}\left(\int e^{ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{2d^3}$$

$$=-\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$+\frac{\text{Subst}\left(\int (a+bx)^n\cos(x)\,dx,x,\arcsin(c+dx)\right)}{4d^3}$$
$$-\frac{\text{Subst}\left(\int (a+bx)^n\cos(3x)\,dx,x,\arcsin(c+dx)\right)}{4d^3}$$
$$-\frac{c\text{Subst}\left(\int (a+bx)^n\sin(2x)\,dx,x,\arcsin(c+dx)\right)}{d^3}$$

$$=-\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}$$
$$+\frac{\text{Subst}\left(\int e^{-ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{8d^3}$$
$$+\frac{\text{Subst}\left(\int e^{ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{8d^3}$$
$$-\frac{\text{Subst}\left(\int e^{-3ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{8d^3}$$
$$-\frac{\text{Subst}\left(\int e^{3ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{8d^3}$$
$$-\frac{(ic)\text{Subst}\left(\int e^{-2ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{2d^3}$$
$$+\frac{(ic)\text{Subst}\left(\int e^{2ix}(a+bx)^n\,dx,x,\arcsin(c+dx)\right)}{2d^3}$$

$$
\begin{aligned}
&= -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3} \\
&-\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3} \\
&+\frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3} \\
&+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3} \\
&+\frac{2^{-2-n}ce^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3} \\
&+\frac{2^{-2-n}ce^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3} \\
&+\frac{i3^{-1-n}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3} \\
&-\frac{i3^{-1-n}e^{\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 419, normalized size of antiderivative = 0.69

$$
\int x^2(a+b\arcsin(c+dx))^n\,dx
$$

$$
= \frac{2^{-3-n}3^{-1-n}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{(a+b\arcsin(c+dx))^2}{b^2}\right)^{-n}\left(-i2^n3^{1+n}(1+4c^2)\,e^{\frac{2ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^n\right.}{}
$$

```
[In] Integrate[x^2*(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] (2^(-3 - n)*3^(-1 - n)*(a + b*ArcSin[c + d*x])^n*((-I)*2^n*3^(1 + n)*(1 + 4
*c^2)*E^(((2*I)*a)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-I)*
(a + b*ArcSin[c + d*x]))/b] + I*2^n*3^(1 + n)*(1 + 4*c^2)*E^(((4*I)*a)/b)*(
((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x])
)/b] + 2*3^(1 + n)*c*E^((I*a)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1
+ n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] + 2*3^(1 + n)*c*E^(((5*I)*a)/b)*((
(-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c + d*
x]))/b] + I*2^n*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-3*I)*(a +
 b*ArcSin[c + d*x]))/b] - I*2^n*E^(((6*I)*a)/b)*(((-I)*(a + b*ArcSin[c + d*
x]))/b)^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c + d*x]))/b]))/(d^3*E^(((3*I)*
a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^n)
```

Maple [F]

$$\int x^2(a+b\arcsin(dx+c))^n\,dx$$

```
[In] int(x^2*(a+b*arcsin(d*x+c))^n,x)
[Out] int(x^2*(a+b*arcsin(d*x+c))^n,x)
```

Fricas [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x + c) + a)^n*x^2, x)
```

Sympy [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int x^2(a+b\,\mathrm{asin}\,(c+dx))^n\,dx$$

```
[In] integrate(x**2*(a+b*asin(d*x+c))**n,x)
[Out] Integral(x**2*(a + b*asin(c + d*x))**n, x)
```

Maxima [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^n*x^2, x)
```

Giac [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^n*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int x^2\,(a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

```
[In] int(x^2*(a + b*asin(c + d*x))^n,x)
[Out] int(x^2*(a + b*asin(c + d*x))^n, x)
```

3.174 $\int x(a+b\arcsin(c+dx))^n\,dx$

Optimal result

Integrand size = 14, antiderivative size = 301

$$\int x(a+b\arcsin(c+dx))^n\,dx = \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{2^{-3-n}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2} - \frac{2^{-3-n}e^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}$$

```
[Out] 1/2*I*c*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d^2/exp(I
*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/2*I*c*exp(I*a/b)*(a+b*arcsin(d*x+c))
^n*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d^2/((I*(a+b*arcsin(d*x+c))/b)^n)-2^(
-3-n)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-2*I*(a+b*arcsin(d*x+c))/b)/d^2/exp(2
*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-2^(-3-n)*exp(2*I*a/b)*(a+b*arcsin(d*
x+c))^n*GAMMA(1+n,2*I*(a+b*arcsin(d*x+c))/b)/d^2/((I*(a+b*arcsin(d*x+c))/b)
^n)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$, Rules used = {4889, 4831, 6873, 12, 6874, 3388, 2212, 4491, 3389}

$$\int x(a+b\arcsin(c+dx))^n\,dx$$
$$= \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2}$$
$$-\frac{2^{-n-3}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}$$
$$-\frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2}$$
$$-\frac{2^{-n-3}e^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}$$

```
[In] Int[x*(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] ((I/2)*c*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*x
]))/b])/(d^2*E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) - ((I/2)*c*E
^((I*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]
))/b])/(d^2*((I*(a + b*ArcSin[c + d*x]))/b)^n) - (2^(-3 - n)*(a + b*ArcSin[
c + d*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/(d^2*E^(((2*I
)*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) - (2^(-3 - n)*E^(((2*I)*a)/b)
*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c + d*x]))/b])
/(d^2*((I*(a + b*ArcSin[c + d*x]))/b)^n)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
```

```
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4831

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Dist[1/c^(m + 1), Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^m
, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \left(-\frac{c}{d}+\frac{x}{d}\right)(a+b\arcsin(x))^n\,dx,x,c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n\cos(x)\left(-\frac{c}{d}+\frac{\sin(x)}{d}\right)\,dx,x,\arcsin(c+dx)\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+bx)^n \cos(x)(-c+\sin(x))}{d}\, dx, x, \arcsin(c+dx)\right)}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n \cos(x)(-c+\sin(x))\, dx, x, \arcsin(c+dx)\right)}{d^2}$$

$$= \frac{\text{Subst}\left(\int \left(-c(a+bx)^n \cos(x)+(a+bx)^n \cos(x)\sin(x)\right)\, dx, x, \arcsin(c+dx)\right)}{d^2}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^n \cos(x)\sin(x)\, dx, x, \arcsin(c+dx)\right)}{d^2} - \frac{c\text{Subst}\left(\int (a+bx)^n \cos(x)\, dx, x, \arcsin(c+dx)\right)}{d^2}$$

$$= \frac{\text{Subst}\left(\int \frac{1}{2}(a+bx)^n \sin(2x)\, dx, x, \arcsin(c+dx)\right)}{d^2} - \frac{c\text{Subst}\left(\int e^{-ix}(a+bx)^n\, dx, x, \arcsin(c+dx)\right)}{2d^2} - \frac{c\text{Subst}\left(\int e^{ix}(a+bx)^n\, dx, x, \arcsin(c+dx)\right)}{2d^2}$$

$$= \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n \left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n} \Gamma\left(1+n, -\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n \left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n} \Gamma\left(1+n, \frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} + \frac{\text{Subst}\left(\int (a+bx)^n \sin(2x)\, dx, x, \arcsin(c+dx)\right)}{2d^2}$$

$$= \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n \left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n} \Gamma\left(1+n, -\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n \left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n} \Gamma\left(1+n, \frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} + \frac{i\text{Subst}\left(\int e^{-2ix}(a+bx)^n\, dx, x, \arcsin(c+dx)\right)}{4d^2} - \frac{i\text{Subst}\left(\int e^{2ix}(a+bx)^n\, dx, x, \arcsin(c+dx)\right)}{4d^2}$$

$$= \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2} - \frac{2^{-3-n}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2} - \frac{2^{-3-n}e^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.89

$$\int x(a+b\arcsin(c+dx))^n\,dx =$$

$$-\frac{i2^{-3-n}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{(a+b\arcsin(c+dx))^2}{b^2}\right)^{-n}\left(-2^{2+n}ce^{\frac{ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^n\Gamma\left(1+n,-\frac{i(a+b\ldots\right.\right.}{}$$

```
[In] Integrate[x*(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-3 - n)*(a + b*ArcSin[c + d*x])^n*(-(2^(2 + n)*c*E^((I*a)/b)*((I*(
a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*x]))/b]
) + 2^(2 + n)*c*E^(((3*I)*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[
1 + n, (I*(a + b*ArcSin[c + d*x]))/b] - I*(((I*(a + b*ArcSin[c + d*x]))/b)^
n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*(((-I)
*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c + d*x]))
/b])))/(d^2*E^(((2*I)*a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^n)
```

Maple [F]

$$\int x(a+b\arcsin(dx+c))^n\,dx$$

```
[In] int(x*(a+b*arcsin(d*x+c))^n,x)
```

```
[Out] int(x*(a+b*arcsin(d*x+c))^n,x)
```

Fricas [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x + c) + a)^n*x, x)
```

Sympy [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int x(a+b\operatorname{asin}(c+dx))^n\,dx$$

```
[In] integrate(x*(a+b*asin(d*x+c))**n,x)
[Out] Integral(x*(a + b*asin(c + d*x))**n, x)
```

Maxima [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^n*x, x)
```

Giac [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n x\,dx$$

```
[In] integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^n*x, x)
```

Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

```
[In] int(x*(a + b*asin(c + d*x))^n,x)
[Out] int(x*(a + b*asin(c + d*x))^n, x)
```

3.175 $\int (a+b\arcsin(c+dx))^n\,dx$

Optimal result

Integrand size = 12, antiderivative size = 147

$$\int (a+b\arcsin(c+dx))^n\,dx = -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d} + \frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d}$$

```
[Out] -1/2*I*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d/exp(I*a/
b)/((-I*(a+b*arcsin(d*x+c))/b)^n)+1/2*I*exp(I*a/b)*(a+b*arcsin(d*x+c))^n*GA
MMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d/((I*(a+b*arcsin(d*x+c))/b)^n)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4887, 4719, 3388, 2212}

$$\int (a+b\arcsin(c+dx))^n\,dx = \frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d} - \frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*
x]))/b])/(d*E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/2)*E^((
I*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]))/
b])/(d*((I*(a + b*ArcSin[c + d*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^n\,dx,x,c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int x^n\cos\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(c+dx)\right)}{2bd}\\
&\quad+\frac{\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(c+dx)\right)}{2bd}
\end{aligned}
$$

$$= -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d} + \frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))^n\,dx = -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)-e^{\frac{2ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right.\right.}{2d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^n,x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c + d*x])^n*(Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d
*x]))/b]/(((-I)*(a + b*ArcSin[c + d*x]))/b)^n - (E^(((2*I)*a)/b)*Gamma[1 +
n, (I*(a + b*ArcSin[c + d*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b)^n))/(d*E
^((I*a)/b))
```

Maple [F]

$$\int (a+b\arcsin(dx+c))^n\,dx$$

```
[In] int((a+b*arcsin(d*x+c))^n,x)
```

```
[Out] int((a+b*arcsin(d*x+c))^n,x)
```

Fricas [F]

$$\int (a+b\arcsin(c+dx))^n\,dx = \int (b\arcsin(dx+c)+a)^n\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(d*x + c) + a)^n, x)
```

Sympy [F]

$$\int (a+b\arcsin(c+dx))^n\,dx=\int \left(a+b\,\mathrm{asin}\,(c+dx)\right)^n\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**n,x)
[Out] Integral((a + b*asin(c + d*x))**n, x)
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin\,(dx+c)+a)^n\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^n, x)
```

Giac [F]

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin\,(dx+c)+a)^n\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^n, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

```
[In] int((a + b*asin(c + d*x))^n,x)
[Out] int((a + b*asin(c + d*x))^n, x)
```

3.176 $\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 16

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \operatorname{Int}\left(\frac{(a+b\arcsin(c+dx))^n}{x},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(d*x+c))^n/x,x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^n/x,x]
```

```
[Out] Defer[Subst][Defer[Int][(a + b*ArcSin[x])^n/(-(c/d) + x/d), x], x, c + d*x]
/d
```

Rubi steps

$$\text{integral} = \frac{\operatorname{Subst}\left(\int \frac{(a+b\arcsin(x))^n}{-\frac{c}{d}+\frac{x}{d}}\,dx,x,c+dx\right)}{d}$$

Mathematica [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx=\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^n/x,x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^n/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.46 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(dx+c))^n}{x}dx$$

```
[In] int((a+b*arcsin(d*x+c))^n/x,x)
[Out] int((a+b*arcsin(d*x+c))^n/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx=\int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x + c) + a)^n/x, x)
```

Sympy [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^n}{x}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**n/x,x)
[Out] Integral((a + b*asin(c + d*x))**n/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.95 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^n/x, x)
```

Giac [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^n/x, x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^n}{x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^n/x,x)
[Out] int((a + b*asin(c + d*x))^n/x, x)
```

3.177 $\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 106

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx=\frac{be^4\sqrt{1-(c+dx)^2}}{5d}-\frac{2be^4\left(1-(c+dx)^2\right)^{3/2}}{15d}+\frac{be^4\left(1-(c+dx)^2\right)^{5/2}}{25d}+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}$$

```
[Out] -2/15*b*e^4*(1-(d*x+c)^2)^(3/2)/d+1/25*b*e^4*(1-(d*x+c)^2)^(5/2)/d+1/5*e^4*
(d*x+c)^5*(a+b*arcsin(d*x+c))/d+1/5*b*e^4*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4889, 12, 4723, 272, 45}

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx=\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}+\frac{be^4\left(1-(c+dx)^2\right)^{5/2}}{25d}-\frac{2be^4\left(1-(c+dx)^2\right)^{3/2}}{15d}+\frac{be^4\sqrt{1-(c+dx)^2}}{5d}$$

```
[In] Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (b*e^4*Sqrt[1 - (c + d*x)^2])/(5*d) - (2*b*e^4*(1 - (c + d*x)^2)^(3/2))/(15
*d) + (b*e^4*(1 - (c + d*x)^2)^(5/2))/(25*d) + (e^4*(c + d*x)^5*(a + b*ArcS
in[c + d*x]))/(5*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^4x^4(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int x^4(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}-\frac{(be^4)\,\text{Subst}\left(\int\frac{x^5}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{5d}\\
&= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}-\frac{(be^4)\,\text{Subst}\left(\int\frac{x^2}{\sqrt{1-x}}\,dx,x,(c+dx)^2\right)}{10d}
\end{aligned}$$

$$= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d} - \frac{(be^4)\,\text{Subst}\left(\int\left(\frac{1}{\sqrt{1-x}}-2\sqrt{1-x}+(1-x)^{3/2}\right)dx,x,(c+dx)^2\right)}{10d}$$

$$= \frac{be^4\sqrt{1-(c+dx)^2}}{5d} - \frac{2be^4(1-(c+dx)^2)^{3/2}}{15d} + \frac{be^4(1-(c+dx)^2)^{5/2}}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.73

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx = \frac{e^4\left(-\frac{1}{75}b\sqrt{1-(c+dx)^2}\left(-15+10(1-(c+dx)^2)-3(-1+(c+dx)^2)^2\right)+\frac{1}{5}(c+dx)^5(a+b\arcsin(c+d\right.}{d}$$

```
[In] Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x]),x]
[Out] (e^4*(-1/75*(b*Sqrt[1 - (c + d*x)^2]*(-15 + 10*(1 - (c + d*x)^2) - 3*(-1 +
(c + d*x)^2)^2)) + ((c + d*x)^5*(a + b*ArcSin[c + d*x]))/5))/d
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.93

method	result	size
derivativedivides	$\frac{\frac{e^4 a(dx+c)^5}{5}+e^4 b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$	99
default	$\frac{\frac{e^4 a(dx+c)^5}{5}+e^4 b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$	99
parts	$\frac{e^4 a(dx+c)^5}{5d}+\frac{e^4 b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$	101

```
[In] int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/d*(1/5*e^4*a*(d*x+c)^5+e^4*b*(1/5*(d*x+c)^5*arcsin(d*x+c)+1/25*(d*x+c)^4*
(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+8/75*(1-(d*x+c)^2)^(
1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 262 vs. 2(92) = 184.

Time = 0.29 (sec) , antiderivative size = 262, normalized size of antiderivative = 2.47

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$$
$$= \frac{15\,ad^5e^4x^5+75\,acd^4e^4x^4+150\,ac^2d^3e^4x^3+150\,ac^3d^2e^4x^2+75\,ac^4de^4x+15\,(bd^5e^4x^5+5\,bcd^4e^4x^4+10\,b}{}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/75*(15*a*d^5*e^4*x^5 + 75*a*c*d^4*e^4*x^4 + 150*a*c^2*d^3*e^4*x^3 + 150*a
*c^3*d^2*e^4*x^2 + 75*a*c^4*d*e^4*x + 15*(b*d^5*e^4*x^5 + 5*b*c*d^4*e^4*x^4
 + 10*b*c^2*d^3*e^4*x^3 + 10*b*c^3*d^2*e^4*x^2 + 5*b*c^4*d*e^4*x + b*c^5*e^
4)*arcsin(d*x + c) + (3*b*d^4*e^4*x^4 + 12*b*c*d^3*e^4*x^3 + 2*(9*b*c^2 + 2
*b)*d^2*e^4*x^2 + 4*(3*b*c^3 + 2*b*c)*d*e^4*x + (3*b*c^4 + 4*b*c^2 + 8*b)*e
^4)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 527 vs. 2(85) = 170.

Time = 0.38 (sec) , antiderivative size = 527, normalized size of antiderivative = 4.97

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$$
$$= \begin{cases} ac^4e^4x+2ac^3de^4x^2+2ac^2d^2e^4x^3+acd^3e^4x^4+\frac{ad^4e^4x^5}{5}+\frac{bc^5e^4\operatorname{asin}(c+dx)}{5d}+bc^4e^4x\operatorname{asin}(c+dx)+\frac{bc^4e^4\sqrt{-c}}{} \\ c^4e^4x(a+b\operatorname{asin}(c)) \end{cases}$$

```
[In] integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c)),x)
```

```
[Out] Piecewise((a*c**4*e**4*x + 2*a*c**3*d*e**4*x**2 + 2*a*c**2*d**2*e**4*x**3 +
 a*c*d**3*e**4*x**4 + a*d**4*e**4*x**5/5 + b*c**5*e**4*asin(c + d*x)/(5*d)
+ b*c**4*e**4*x*asin(c + d*x) + b*c**4*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**
2 + 1)/(25*d) + 2*b*c**3*d*e**4*x**2*asin(c + d*x) + 4*b*c**3*e**4*x*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 2*b*c**2*d**2*e**4*x**3*asin(c + d*x)
+ 6*b*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*b*c**2*
e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(75*d) + b*c*d**3*e**4*x**4*asin
(c + d*x) + 4*b*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 +
 8*b*c*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + b*d**4*e**4*x**5*a
sin(c + d*x)/5 + b*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25
+ 4*b*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + 8*b*e**4*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)/(75*d), Ne(d, 0)), (c**4*e**4*x*(a + b*asi
n(c)), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1280 vs. 2(92) = 184.

Time = 0.28 (sec) , antiderivative size = 1280, normalized size of antiderivative = 12.08

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/5*a*d^4*e^4*x^5 + a*c*d^3*e^4*x^4 + 2*a*c^2*d^2*e^4*x^3 + 2*a*c^3*d*e^4*x
^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
 (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)
*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*c/d^3))*b*c^3*d*e^4 + 1/3*(6*x^3*arcsin(d*x + c) + d*
(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d
)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 -
2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*b*c^2*d^2*e^4 + 1/24*(24*x^4*arcsin(d*x
+ c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
(c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*
(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 10
5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x -
c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2
 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/
d^5)*d)*b*c*d^3*e^4 + 1/600*(120*x^5*arcsin(d*x + c) + (24*sqrt(-d^2*x^2 -
2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^3/d^
3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x^2/d^4 - 945*c^5*arcsin(-(d
^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 315*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1)*c^3*x/d^5 - 32*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x^
2/d^4 + 1050*(c^2 - 1)*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d
^2))/d^6 + 945*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^4/d^6 + 161*sqrt(-d^2*x
^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c*x/d^5 - 225*(c^2 - 1)^2*c*arcsin(-(d^2*
x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 735*sqrt(-d^2*x^2 - 2*c*d*x -
 c^2 + 1)*(c^2 - 1)*c^2/d^6 + 64*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 -
1)^2/d^6)*d)*b*d^4*e^4 + a*c^4*e^4*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(
d*x + c)^2 + 1))*b*c^4*e^4/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.64

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx = \frac{(dx+c)^5ae^4}{5\,d} + \frac{\left((dx+c)^2-1\right)^2(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} + \frac{2\left((dx+c)^2-1\right)(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} + \frac{\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}be^4}{25\,d} + \frac{(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^4}{15\,d} + \frac{\sqrt{-(dx+c)^2+1}be^4}{5\,d}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/5*(d*x + c)^5*a*e^4/d + 1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b*e^4*arcsin(d*
x + c)/d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b*e^4*arcsin(d*x + c)/d + 1/25*(
(d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b*e^4/d + 1/5*(d*x + c)*b*e^4*arc
sin(d*x + c)/d - 2/15*(-(d*x + c)^2 + 1)^(3/2)*b*e^4/d + 1/5*sqrt(-(d*x + c
)^2 + 1)*b*e^4/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx = \int {\left(c\,e+d\,e\,x\right)}^4\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right) \,d x$$

```
[In] int((c*e + d*e*x)^4*(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^4*(a + b*asin(c + d*x)), x)
```

3.178 $\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 109

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}}{32d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}}{16d} - \frac{3be^3\arcsin(c+dx)}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d}$$

```
[Out] -3/32*b*e^3*arcsin(d*x+c)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))/d+3/32*b*
e^3*(d*x+c)*(1-(d*x+c)^2)^(1/2)/d+1/16*b*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/
d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {4889, 12, 4723, 327, 222}

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d} - \frac{3be^3\arcsin(c+dx)}{32d} + \frac{be^3\sqrt{1-(c+dx)^2}(c+dx)^3}{16d} + \frac{3be^3\sqrt{1-(c+dx)^2}(c+dx)}{32d}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (3*b*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(32*d) + (b*e^3*(c + d*x)^3*Sqrt[
1 - (c + d*x)^2])/(16*d) - (3*b*e^3*ArcSin[c + d*x])/(32*d) + (e^3*(c + d*x
)^4*(a + b*ArcSin[c + d*x]))/(4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d}-\frac{(be^3)\,\text{Subst}\left(\int\frac{x^4}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}
\end{aligned}
$$

$$= \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}}{16d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d} - \frac{(3be^3)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{16d}$$

$$= \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}}{32d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}}{16d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d} - \frac{(3be^3)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{32d}$$

$$= \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}}{32d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}}{16d} - \frac{3be^3\arcsin(c+dx)}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.80

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{e^3\left(3b(c+dx)\sqrt{1-(c+dx)^2} + 2b(c+dx)^3\sqrt{1-(c+dx)^2} - 3b\arcsin(c+dx) + 8(c+dx)^4(a+b\arcsin(\right.}{32d}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^3*(3*b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + 2*b*(c + d*x)^3*Sqrt[1 - (c + d
*x)^2] - 3*b*ArcSin[c + d*x] + 8*(c + d*x)^4*(a + b*ArcSin[c + d*x])))/(32*
d)
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.83

method	result	size
derivativedivides	$\frac{\frac{e^3 a(dx+c)^4}{4}+e^3 b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$	90
default	$\frac{\frac{e^3 a(dx+c)^4}{4}+e^3 b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$	90
parts	$\frac{e^3 a(dx+c)^4}{4d}+\frac{e^3 b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$	92

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/4*e^3*a*(d*x+c)^4+e^3*b*(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*(d*x+c)^3*
(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 209 vs. $2(97) = 194$.

Time = 0.27 (sec) , antiderivative size = 209, normalized size of antiderivative = 1.92

$$\int (ce + dex)^3(a + b\arcsin(c + dx))\,dx$$
$$= \frac{8\,ad^4e^3x^4 + 32\,acd^3e^3x^3 + 48\,ac^2d^2e^3x^2 + 32\,ac^3de^3x + (8\,bd^4e^3x^4 + 32\,bcd^3e^3x^3 + 48\,bc^2d^2e^3x^2 + 32\,bc^3d}{}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/32*(8*a*d^4*e^3*x^4 + 32*a*c*d^3*e^3*x^3 + 48*a*c^2*d^2*e^3*x^2 + 32*a*c^
3*d*e^3*x + (8*b*d^4*e^3*x^4 + 32*b*c*d^3*e^3*x^3 + 48*b*c^2*d^2*e^3*x^2 +
32*b*c^3*d*e^3*x + (8*b*c^4 - 3*b)*e^3)*arcsin(d*x + c) + (2*b*d^3*e^3*x^3
+ 6*b*c*d^2*e^3*x^2 + 3*(2*b*c^2 + b)*d*e^3*x + (2*b*c^3 + 3*b*c)*e^3)*sqrt
(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 394 vs. $2(94) = 188$.

Time = 0.29 (sec) , antiderivative size = 394, normalized size of antiderivative = 3.61

$$\int (ce + dex)^3(a + b\arcsin(c + dx))\,dx$$
$$= \begin{cases} ac^3e^3x + \frac{3ac^2de^3x^2}{2} + acd^2e^3x^3 + \frac{ad^3e^3x^4}{4} + \frac{bc^4e^3\operatorname{asin}(c+dx)}{4d} + bc^3e^3x\operatorname{asin}(c+dx) + \frac{bc^3e^3\sqrt{-c^2-2cdx-d^2x^2+1}}{16d} + \\ c^3e^3x(a + b\operatorname{asin}(c)) \end{cases}$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c)),x)
```

```
[Out] Piecewise((a*c**3*e**3*x + 3*a*c**2*d*e**3*x**2/2 + a*c*d**2*e**3*x**3 + a*
d**3*e**3*x**4/4 + b*c**4*e**3*asin(c + d*x)/(4*d) + b*c**3*e**3*x*asin(c +
 d*x) + b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(16*d) + 3*b*c**2
*d*e**3*x**2*asin(c + d*x)/2 + 3*b*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*
x**2 + 1)/16 + b*c*d**2*e**3*x**3*asin(c + d*x) + 3*b*c*d*e**3*x**2*sqrt(-c
**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*b*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*
x**2 + 1)/(32*d) + b*d**3*e**3*x**4*asin(c + d*x)/4 + b*d**2*e**3*x**3*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*b*e**3*x*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)/32 - 3*b*e**3*asin(c + d*x)/(32*d), Ne(d, 0)), (c**3*e**3*x*(a
 + b*asin(c)), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 816 vs. $2(97) = 194$.

Time = 0.27 (sec) , antiderivative size = 816, normalized size of antiderivative = 7.49

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{1}{4}ad^3e^3x^4 + acd^2e^3x^3 + \frac{3}{2}ac^2de^3x^2 + \frac{3}{4}\left(2x^2\arcsin(dx+c) + d\left(\frac{3c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} + \frac{\sqrt{-d^2x^2-2cdx-c^2+1}x}{d^2} - \frac{(c^2-1)\arcs\cdots}{\cdots}\right.\right.$$
$$+\frac{1}{6}\left(6x^3\arcsin(dx+c) + d\left(\frac{2\sqrt{-d^2x^2-2cdx-c^2+1}x^2}{d^2} - \frac{15c^3\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^4} - \frac{5\sqrt{-d^2x\cdots}}{\cdots}\right.\right.$$
$$+\frac{1}{96}\left(24x^4\arcsin(dx+c) + \left(\frac{6\sqrt{-d^2x^2-2cdx-c^2+1}x^3}{d^2} - \frac{14\sqrt{-d^2x^2-2cdx-c^2+1}cx^2}{d^3} + \frac{105c^4\cdots}{\cdots}\right.\right.$$
$$+ac^3e^3x + \frac{\left((dx+c)\arcsin(dx+c) + \sqrt{-(dx+c)^2+1}\right)bc^3e^3}{d}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*a*d^3*e^3*x^4 + a*c*d^2*e^3*x^3 + 3/2*a*c^2*d*e^3*x^2 + 3/4*(2*x^2*arcs
in(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))
/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x
+ c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2
 + 1)*c/d^3))*b*c^2*d*e^3 + 1/6*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
 (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^
2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt
(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
1)*(c^2 - 1)/d^4))*b*c*d^2*e^3 + 1/96*(24*x^4*arcsin(d*x + c) + (6*sqrt(-d^
2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^
5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*(c^2 - 1)*c^2*arcs
in(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 105*sqrt(-d^2*x^2 -
2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)
*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))
/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)*d)*b*d^3*e^3
+ a*c^3*e^3*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b*c^3*
e^3/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.25

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{(dx+c)^4ae^3}{4\,d} + \frac{\left((dx+c)^2-1\right)^2be^3\arcsin(dx+c)}{4\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)be^3}{16\,d} + \frac{\left((dx+c)^2-1\right)be^3\arcsin(dx+c)}{2\,d} + \frac{5\sqrt{-(dx+c)^2+1}(dx+c)be^3}{32\,d} + \frac{5\,be^3\arcsin(dx+c)}{32\,d}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/4*(d*x + c)^4*a*e^3/d + 1/4*((d*x + c)^2 - 1)^2*b*e^3*arcsin(d*x + c)/d -
 1/16*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b*e^3/d + 1/2*((d*x + c)^2 - 1)*b*
e^3*arcsin(d*x + c)/d + 5/32*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b*e^3/d + 5/3
2*b*e^3*arcsin(d*x + c)/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x)), x)
```

3.179 $\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx=\frac{be^2\sqrt{1-(c+dx)^2}}{3d}-\frac{be^2(1-(c+dx)^2)^{3/2}}{9d}+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}$$

```
[Out] -1/9*b*e^2*(1-(d*x+c)^2)^(3/2)/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))/d+1/
3*b*e^2*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4889, 12, 4723, 272, 45}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx=\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}-\frac{be^2(1-(c+dx)^2)^{3/2}}{9d}+\frac{be^2\sqrt{1-(c+dx)^2}}{3d}$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (b*e^2*Sqrt[1 - (c + d*x)^2])/(3*d) - (b*e^2*(1 - (c + d*x)^2)^(3/2))/(9*d)
 + (e^2*(c + d*x)^3*(a + b*ArcSin[c + d*x]))/(3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}-\frac{(be^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3d}\\
&= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}-\frac{(be^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x}}\,dx,x,(c+dx)^2\right)}{6d}\\
&= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}-\frac{(be^2)\,\text{Subst}\left(\int \left(\frac{1}{\sqrt{1-x}}-\sqrt{1-x}\right)\,dx,x,(c+dx)^2\right)}{6d}\\
&= \frac{be^2\sqrt{1-(c+dx)^2}}{3d}-\frac{be^2(1-(c+dx)^2)^{3/2}}{9d}+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{e^2\left(b(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2}+3(c+dx)^3(a+b\arcsin(c+dx))\right)}{9d}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x]),x]
[Out] (e^2*(b*(2 + c^2 + 2*c*d*x + d^2*x^2)*Sqrt[1 - (c + d*x)^2] + 3*(c + d*x)^3
*(a + b*ArcSin[c + d*x])))/(9*d)
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.96

method	result	size
derivativedivides	$\frac{\frac{a\,e^2(dx+c)^3}{3}+e^2b\left(\frac{(dx+c)^3\arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$	77
default	$\frac{\frac{a\,e^2(dx+c)^3}{3}+e^2b\left(\frac{(dx+c)^3\arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$	77
parts	$\frac{a\,e^2(dx+c)^3}{3d}+\frac{e^2b\left(\frac{(dx+c)^3\arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$	79

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/d*(1/3*a*e^2*(d*x+c)^3+e^2*b*(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(
1-(d*x+c)^2)^(1/2)+2/9*(1-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 151 vs. $2(70) = 140$.

Time = 0.26 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.89

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{3\,ad^3e^2x^3+9\,acd^2e^2x^2+9\,ac^2de^2x+3\,(bd^3e^2x^3+3\,bcd^2e^2x^2+3\,bc^2de^2x+bc^3e^2)\arcsin(dx+c)+(bd^2e^2}{9\,d}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*a*d^3*e^2*x^3 + 9*a*c*d^2*e^2*x^2 + 9*a*c^2*d*e^2*x + 3*(b*d^3*e^2*x
^3 + 3*b*c*d^2*e^2*x^2 + 3*b*c^2*d*e^2*x + b*c^3*e^2)*arcsin(d*x + c) + (b*
d^2*e^2*x^2 + 2*b*c*d*e^2*x + (b*c^2 + 2*b)*e^2)*sqrt(-d^2*x^2 - 2*c*d*x -
c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 258 vs. $2(63) = 126$.

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 3.22

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$$
$$= \begin{cases} ac^2e^2x + acde^2x^2 + \frac{ad^2e^2x^3}{3} + \frac{bc^3e^2\operatorname{asin}(c+dx)}{3d} + bc^2e^2x\operatorname{asin}(c+dx) + \frac{bc^2e^2\sqrt{-c^2-2cdx-d^2x^2+1}}{9d} + bcde^2x^2\operatorname{asin} \\ c^2e^2x(a+b\operatorname{asin}(c)) \end{cases}$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c)),x)
```

```
[Out] Piecewise((a*c**2*e**2*x + a*c*d*e**2*x**2 + a*d**2*e**2*x**3/3 + b*c**3*e*
*2*asin(c + d*x)/(3*d) + b*c**2*e**2*x*asin(c + d*x) + b*c**2*e**2*sqrt(-c*
*2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + b*c*d*e**2*x**2*asin(c + d*x) + 2*b*c
*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + b*d**2*e**2*x**3*asin(c +
 d*x)/3 + b*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + 2*b*e**2*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d), Ne(d, 0)), (c**2*e**2*x*(a + b
*asin(c)), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 457 vs. $2(70) = 140$.

Time = 0.28 (sec) , antiderivative size = 457, normalized size of antiderivative = 5.71

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{1}{3}ad^2e^2x^3 + acde^2x^2$$
$$+\frac{1}{2}\left(2x^2\arcsin(dx+c) + d\left(\frac{3c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} + \frac{\sqrt{-d^2x^2-2cdx-c^2+1}x}{d^2} - \frac{(c^2-1)\operatorname{arc}}{}\right.\right.$$
$$+\frac{1}{18}\left(6x^3\arcsin(dx+c) + d\left(\frac{2\sqrt{-d^2x^2-2cdx-c^2+1}x^2}{d^2} - \frac{15c^3\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^4} - \frac{5\sqrt{-}}{}\right.\right.$$
$$+ac^2e^2x + \frac{\left((dx+c)\arcsin(dx+c) + \sqrt{-(dx+c)^2+1}\right)bc^2e^2}{d}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/3*a*d^2*e^2*x^3 + a*c*d*e^2*x^2 + 1/2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*a
rcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c
^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*b*c*d*e^2
+ 1/18*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2
/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x +
 c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2
 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*b*d^2*
e^2 + a*c^2*e^2*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b*
c^2*e^2/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.38

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{(dx+c)^3ae^2}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)be^2\arcsin\left(dx+c\right)}{3\,d} + \frac{(dx+c)be^2\arcsin\left(dx+c\right)}{3\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^2}{9\,d} + \frac{\sqrt{-(dx+c)^2+1}be^2}{3\,d}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/3*(d*x + c)^3*a*e^2/d + 1/3*((d*x + c)^2 - 1)*(d*x + c)*b*e^2*arcsin(d*x
+ c)/d + 1/3*(d*x + c)*b*e^2*arcsin(d*x + c)/d - 1/9*(-(d*x + c)^2 + 1)^(3/
2)*b*e^2/d + 1/3*sqrt(-(d*x + c)^2 + 1)*b*e^2/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \int {\left(c\,e+d\,e\,x\right)}^2\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x)), x)
```

3.180 $\int (ce+dex)(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 70

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx = \frac{be(c+dx)\sqrt{1-(c+dx)^2}}{4d} - \frac{be\arcsin(c+dx)}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d}$$

```
[Out] -1/4*b*e*arcsin(d*x+c)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))/d+1/4*b*e*(d*x
+c)*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4889, 12, 4723, 327, 222}

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx = \frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d} - \frac{be\arcsin(c+dx)}{4d} + \frac{be\sqrt{1-(c+dx)^2}(c+dx)}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (b*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(4*d) - (b*e*ArcSin[c + d*x])/(4*d) +
 (e*(c + d*x)^2*(a + b*ArcSin[c + d*x]))/(2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}(\int ex(a+b\arcsin(x))\,dx,x,c+dx)}{d}\\
&= \frac{e\text{Subst}(\int x(a+b\arcsin(x))\,dx,x,c+dx)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d}-\frac{(be)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\\
&= \frac{be(c+dx)\sqrt{1-(c+dx)^2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d}\\
&\quad -\frac{(be)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{be(c+dx)\sqrt{1-(c+dx)^2}}{4d}-\frac{be\arcsin(c+dx)}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.84

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx = \frac{e\left(b(c+dx)\sqrt{1-(c+dx)^2}-b\arcsin(c+dx)+2(c+dx)^2(a+b\arcsin(c+dx))\right)}{4d}$$

[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x]),x]

[Out] (e*(b*(c + d*x)*Sqrt[1 - (c + d*x)^2] - b*ArcSin[c + d*x] + 2*(c + d*x)^2*(a + b*ArcSin[c + d*x])))/(4*d)

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.91

method	result	size
derivativedivides	$\frac{\frac{ae(dx+c)^2}{2}+eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$	64
default	$\frac{\frac{ae(dx+c)^2}{2}+eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$	64
parts	$ae\left(\frac{1}{2}d\,x^2+cx\right)+\frac{eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$	65

[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)

[Out] 1/d*(1/2*a*e*(d*x+c)^2+e*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*x+c)^2)^(1/2)-1/4*arcsin(d*x+c)))

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.33

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx = \frac{2\,ad^2ex^2+4\,acdex+(2\,bd^2ex^2+4\,bcdex+(2\,bc^2-b)e)\arcsin(dx+c)+(bdex+bce)\sqrt{-d^2x^2-2\,cdx-}}{4\,d}$$

[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")

```
[Out] 1/4*(2*a*d^2*e*x^2 + 4*a*c*d*e*x + (2*b*d^2*e*x^2 + 4*b*c*d*e*x + (2*b*c^2
- b)*e)*arcsin(d*x + c) + (b*d*e*x + b*c*e)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 148 vs. 2(58) = 116.

Time = 0.13 (sec) , antiderivative size = 148, normalized size of antiderivative = 2.11

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx$$
$$= \begin{cases} acex + \frac{adex^2}{2} + \frac{bc^2e\,\mathrm{asin}\,(c+dx)}{2d} + bcex\,\mathrm{asin}\,(c+dx) + \frac{bce\sqrt{-c^2-2cdx-d^2x^2+1}}{4d} + \frac{bdex^2\,\mathrm{asin}\,(c+dx)}{2} + \frac{bex\sqrt{-c^2-2cdx-d^2x^2+1}}{4} \\ cex(a+b\,\mathrm{asin}\,(c)) \end{cases}$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c)),x)
```

```
[Out] Piecewise((a*c*e*x + a*d*e*x**2/2 + b*c**2*e*asin(c + d*x)/(2*d) + b*c*e*x*
asin(c + d*x) + b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(4*d) + b*d*e*x
**2*asin(c + d*x)/2 + b*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4 - b*e*a
sin(c + d*x)/(4*d), Ne(d, 0)), (c*e*x*(a + b*asin(c)), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 204 vs. 2(62) = 124.

Time = 0.26 (sec) , antiderivative size = 204, normalized size of antiderivative = 2.91

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx = \frac{1}{2}\,adex^2$$
$$+\frac{1}{4}\left(2\,x^2\arcsin\left(dx+c\right)+d\left(\frac{3\,c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3}+\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}x}{d^2}-\frac{(c^2-1)\arcs\ldots}{}\right.\right.$$
$$+acex+\frac{\left((dx+c)\arcsin\left(dx+c\right)+\sqrt{-(dx+c)^2+1}\right)bce}{d}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*a*d*e*x^2 + 1/4*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)
/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/
d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 -
3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*b*d*e + a*c*e*x + ((d*x + c)*a
rcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b*c*e/d
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.10

$$\int (ce + dex)(a + b \arcsin(c + dx)) \, dx = \frac{((dx + c)^2 - 1)be \arcsin(dx + c)}{2d} + \frac{\sqrt{-(dx + c)^2 + 1}(dx + c)be}{4d} + \frac{((dx + c)^2 - 1)ae}{2d} + \frac{be \arcsin(dx + c)}{4d}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] 1/2*((d*x + c)^2 - 1)*b*e*arcsin(d*x + c)/d + 1/4*sqrt(-(d*x + c)^2 + 1)*(d
*x + c)*b*e/d + 1/2*((d*x + c)^2 - 1)*a*e/d + 1/4*b*e*arcsin(d*x + c)/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce + dex)(a + b \arcsin(c + dx)) \, dx = \int (c\,e + d\,e\,x) \, (a + b\,\mathrm{asin}(c + d\,x)) \, dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x)), x)
```

3.181 $\int (a + b \arcsin(c + dx))\, dx$

Optimal result

Integrand size = 10, antiderivative size = 40

$$\int (a + b \arcsin(c + dx))\, dx = ax + \frac{b\sqrt{1 - (c + dx)^2}}{d} + \frac{b(c + dx) \arcsin(c + dx)}{d}$$

```
[Out] a*x+b*(d*x+c)*arcsin(d*x+c)/d+b*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4887, 4715, 267}

$$\int (a + b \arcsin(c + dx))\, dx = ax + \frac{b(c + dx) \arcsin(c + dx)}{d} + \frac{b\sqrt{1 - (c + dx)^2}}{d}$$

```
[In] Int[a + b*ArcSin[c + d*x],x]
```

```
[Out] a*x + (b*Sqrt[1 - (c + d*x)^2])/d + (b*(c + d*x)*ArcSin[c + d*x])/d
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= ax + b\int \arcsin(c+dx)\,dx\\ &= ax + \frac{b\text{Subst}(\int \arcsin(x)\,dx, x, c+dx)}{d}\\ &= ax + \frac{b(c+dx)\arcsin(c+dx)}{d} - \frac{b\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}\\ &= ax + \frac{b\sqrt{1-(c+dx)^2}}{d} + \frac{b(c+dx)\arcsin(c+dx)}{d}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 159 vs. $2(40) = 80$.

Time = 0.38 (sec) , antiderivative size = 159, normalized size of antiderivative = 3.98

$$\int (a+b\arcsin(c+dx))\,dx = ax + bx\arcsin(c+dx) + \frac{b\left(2d\sqrt{1-c^2-2cdx-d^2x^2} + 2cd\arctan\left(\frac{\sqrt{-d^2}x-\sqrt{1-c^2-2cdx-d^2x^2}}{c}\right) + c\sqrt{-d^2}\log\left(-1+2cdx+2d^2x^2+\right.\right.}{2d^2}$$

```
[In] Integrate[a + b*ArcSin[c + d*x],x]
```

```
[Out] a*x + b*x*ArcSin[c + d*x] + (b*(2*d*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] + 2*c
*d*ArcTan[(Sqrt[-d^2]*x - Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/c] + c*Sqrt[-d
^2]*Log[-1 + 2*c*d*x + 2*d^2*x^2 + 2*Sqrt[-d^2]*x*Sqrt[1 - c^2 - 2*c*d*x -
d^2*x^2]]))/(2*d^2)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

method	result	size
default	$ax+\frac{b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$	36
parts	$ax+\frac{b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$	36
derivativedivides	$\frac{(dx+c)a+b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$	41

```
[In] int(a+b*arcsin(d*x+c),x,method=_RETURNVERBOSE)
[Out] a*x+b/d*((d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.20

$$\int (a+b\arcsin(c+dx))\,dx=\frac{adx+(bdx+bc)\arcsin(dx+c)+\sqrt{-d^2x^2-2\,cdx-c^2+1}b}{d}$$

```
[In] integrate(a+b*arcsin(d*x+c),x, algorithm="fricas")
[Out] (a*d*x + (b*d*x + b*c)*arcsin(d*x + c) + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*b)/d
```

Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.28

$$\int (a+b\arcsin(c+dx))\,dx = ax+b\left(\begin{cases}\frac{c\,\mathrm{asin}\,(c+dx)}{d}+x\,\mathrm{asin}\,(c+dx)+\frac{\sqrt{-c^2-2cdx-d^2x^2+1}}{d} & \text{for } d\neq 0\\ x\,\mathrm{asin}\,(c) & \text{otherwise}\end{cases}\right)$$

```
[In] integrate(a+b*asin(d*x+c),x)
[Out] a*x + b*Piecewise((c*asin(c + d*x)/d + x*asin(c + d*x) + sqrt(-c**2 - 2*c*d
*x - d**2*x**2 + 1)/d, Ne(d, 0)), (x*asin(c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))\,dx = ax + \frac{\left((dx+c)\arcsin\left(dx+c\right)+\sqrt{-(dx+c)^2+1}\right)b}{d}$$

```
[In] integrate(a+b*arcsin(d*x+c),x, algorithm="maxima")
[Out] a*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b/d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))\,dx = ax + \frac{\left((dx+c)\arcsin\left(dx+c\right)+\sqrt{-(dx+c)^2+1}\right)b}{d}$$

```
[In] integrate(a+b*arcsin(d*x+c),x, algorithm="giac")
[Out] a*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b/d
```

Mupad [B] (verification not implemented)

Time = 0.63 (sec) , antiderivative size = 92, normalized size of antiderivative = 2.30

$$\int (a+b\arcsin(c+dx))\,dx = a\,x + b\,x\,\mathrm{asin}(c+d\,x) + \frac{b\,\sqrt{-c^2-2\,c\,d\,x-d^2\,x^2+1}}{d} + \frac{b\,c\,\ln\left(\sqrt{-c^2-2\,c\,d\,x-d^2\,x^2+1}-\frac{x\,d^2+c\,d}{\sqrt{-d^2}}\right)}{\sqrt{-d^2}}$$

```
[In] int(a + b*asin(c + d*x),x)
[Out] a*x + b*x*asin(c + d*x) + (b*(1 - d^2*x^2 - 2*c*d*x - c^2)^(1/2))/d + (b*c*
log((1 - d^2*x^2 - 2*c*d*x - c^2)^(1/2) - (c*d + d^2*x)/(-d^2)^(1/2)))/(-d^
2)^(1/2)
```

3.182 $\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 89

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=-\frac{i(a+b\arcsin(c+dx))^2}{2bde}+\frac{(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[Out] -1/2*I*(a+b*arcsin(d*x+c))^2/b/d/e+(a+b*arcsin(d*x+c))*ln(1-(I*(d*x+c)+(1-(
d*x+c)^2)^(1/2))^2)/d/e-1/2*I*b*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2
)/d/e
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4889, 12, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=-\frac{i(a+b\arcsin(c+dx))^2}{2bde}+\frac{\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x),x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c + d*x])^2)/(b*d*e) + ((a + b*ArcSin[c + d*x])*Log
[1 - E^((2*I)*ArcSin[c + d*x])])/(d*e) - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSi
n[c + d*x])])/(d*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{ex}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x}\,dx, x, c+dx\right)}{de}\\
&= \frac{\text{Subst}(\int (a+bx)\cot(x)\,dx, x, \arcsin(c+dx))}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^2}{2bde} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^2}{2bde} + \frac{(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad - \frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^2}{2bde} + \frac{(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(c+dx)}\right)}{2de}\\
&= -\frac{i(a+b\arcsin(c+dx))^2}{2bde} + \frac{(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad - \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{2de}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.80

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = \frac{b\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right)+a\log(c+dx)-\frac{1}{2}ib\left(\arcsin(c+dx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)\right)}{de}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x),x]
[Out] (b*ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] + a*Log[c + d*x] - (I
/2)*b*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])]))/(d*e)
```

Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.73

method	result
derivativedivides	$\frac{\frac{a\ln(dx+c)}{e}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+c)^2}\right)+\arcsin(dx+\right.}{e}}{d}$
default	$\frac{\frac{a\ln(dx+c)}{e}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+c)^2}\right)+\arcsin(dx+\right.}{e}}{d}$
parts	$\frac{a\ln(dx+c)}{ed}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+\right.\right.}{ed}$

[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e),x,method=_RETURNVERBOSE)

[Out] 1/d*(a/e*ln(d*x+c)+b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))))

Fricas [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\int \frac{b\arcsin{(dx+c)}+a}{dex+ce}\,dx$$

[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="fricas")

[Out] integral((b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\frac{\int \frac{a}{c+dx}\,dx+\int \frac{b\,\mathrm{asin}\,(c+dx)}{c+dx}\,dx}{e}$$

[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e),x)

[Out] (Integral(a/(c + d*x), x) + Integral(b*asin(c + d*x)/(c + d*x), x))/e

Maxima [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = \int \frac{b\arcsin\left(dx+c\right)+a}{dex+ce}\,dx$$

[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="maxima")

[Out] b*integrate(arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d*e*x + c*e), x) + a*log(d*e*x + c*e)/(d*e)

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = \int \frac{b\arcsin\left(dx+c\right)+a}{dex+ce}\,dx$$

[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="giac")

[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{c\,e+d\,e\,x}\,dx$$

[In] int((a + b*asin(c + d*x))/(c*e + d*e*x),x)

[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x), x)

3.183 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 51

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} - \frac{b\,\mathrm{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^2}$$

```
[Out] (-a-b*arcsin(d*x+c))/d/e^2/(d*x+c)-b*arctanh((1-(d*x+c)^2)^(1/2))/d/e^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4889, 12, 4723, 272, 65, 212}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} - \frac{b\,\mathrm{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c + d*x])/(d*e^2*(c + d*x))) - (b*ArcTanh[Sqrt[1 - (c + d*x
)^2]])/(d*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
```

```
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{e^2x^2}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^2}\,dx, x, c+dx\right)}{de^2}\\
&= -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} + \frac{b\text{Subst}\left(\int \frac{1}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^2}\\
&= -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} + \frac{b\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x}\,dx, x, (c+dx)^2\right)}{2de^2}\\
&= -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} - \frac{b\text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, \sqrt{1-(c+dx)^2}\right)}{de^2}
\end{aligned}$$

$$= -\frac{a + b\arcsin(c + dx)}{de^2(c + dx)} - \frac{b\operatorname{arctanh}\left(\sqrt{1 - (c + dx)^2}\right)}{de^2}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.88

$$\int \frac{a + b\arcsin(c + dx)}{(ce + dex)^2}\,dx = -\frac{\frac{a+b\arcsin(c+dx)}{c+dx} + b\operatorname{arctanh}\left(\sqrt{1 - (c + dx)^2}\right)}{de^2}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^2,x]
```

```
[Out] -(((a + b*ArcSin[c + d*x])/(c + d*x) + b*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(d
*e^2))
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.10

method	result	size
derivativedivides	$\frac{-\frac{a}{e^2(dx+c)} + \frac{b\left(-\frac{\arcsin(dx+c)}{dx+c} - \operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2}}{d}$	56
default	$\frac{-\frac{a}{e^2(dx+c)} + \frac{b\left(-\frac{\arcsin(dx+c)}{dx+c} - \operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2}}{d}$	56
parts	$-\frac{a}{e^2(dx+c)d} + \frac{b\left(-\frac{\arcsin(dx+c)}{dx+c} - \operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2 d}$	58

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a/e^2/(d*x+c)+b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-(d*x+c)^2)
^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 101 vs. 2(49) = 98.

Time = 0.27 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.98

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{2\,b\arcsin\left(dx+c\right)+\left(bdx+bc\right)\log\left(\sqrt{-d^2x^2-2\,cdx-c^2+1}+1\right)-\left(bdx+bc\right)\log\left(\sqrt{-d^2x^2-2\,cdx-\right.}{2\left(d^2e^2x+cde^2\right)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*arcsin(d*x + c) + (b*d*x + b*c)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2
 + 1) + 1) - (b*d*x + b*c)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) - 1) + 2*
a)/(d^2*e^2*x + c*d*e^2)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = \frac{\int \frac{a}{c^2+2cdx+d^2x^2}\,dx+\int \frac{b\operatorname{asin}\left(c+dx\right)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**2,x)
```

```
[Out] (Integral(a/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b*asin(c + d*x)/(c*
*2 + 2*c*d*x + d**2*x**2), x))/e**2
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 108 vs. $2(49) = 98$.

Time = 0.30 (sec) , antiderivative size = 108, normalized size of antiderivative = 2.12

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^2} \, dx =$$
$$-\frac{1}{2} \, bde^2 \left(\frac{\log\left(\sqrt{-\frac{(dex+ce)^2}{e^2} + 1} + 1\right) - \log\left(-\sqrt{-\frac{(dex+ce)^2}{e^2} + 1} + 1\right)}{d^2 e^4} + \frac{2 \, \arcsin\left(dx + c\right)}{(dex + ce)d^2 e^3} \right)$$
$$- \frac{a}{(dex + ce)de}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="giac")
[Out] -1/2*b*d*e^2*((log(sqrt(-(d*e*x + c*e)^2/e^2 + 1) + 1) - log(-sqrt(-(d*e*x
+ c*e)^2/e^2 + 1) + 1))/(d^2*e^4) + 2*arcsin(d*x + c)/((d*e*x + c*e)*d^2*e^
3)) - a/((d*e*x + c*e)*d*e)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^2} \, dx = \int \frac{a + b \operatorname{asin}(c + d \, x)}{(c \, e + d \, e \, x)^2} \, dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^2,x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^2, x)
```

3.184 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 61

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx=-\frac{b\sqrt{1-(c+dx)^2}}{2de^3(c+dx)}-\frac{a+b\arcsin(c+dx)}{2de^3(c+dx)^2}$$

```
[Out] 1/2*(-a-b*arcsin(d*x+c))/d/e^3/(d*x+c)^2-1/2*b*(1-(d*x+c)^2)^(1/2)/d/e^3/(d
*x+c)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4889, 12, 4723, 270}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx=-\frac{a+b\arcsin(c+dx)}{2de^3(c+dx)^2}-\frac{b\sqrt{1-(c+dx)^2}}{2de^3(c+dx)}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^3,x]
```

```
[Out] -1/2*(b*Sqrt[1 - (c + d*x)^2])/(d*e^3*(c + d*x)) - (a + b*ArcSin[c + d*x])/
(2*d*e^3*(c + d*x)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{e^3x^3}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^3}\,dx, x, c+dx\right)}{de^3}\\
&= -\frac{a+b\arcsin(c+dx)}{2de^3(c+dx)^2}+\frac{b\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2de^3}\\
&= -\frac{b\sqrt{1-(c+dx)^2}}{2de^3(c+dx)}-\frac{a+b\arcsin(c+dx)}{2de^3(c+dx)^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.80

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{a+b(c+dx)\sqrt{1-(c+dx)^2}+b\arcsin(c+dx)}{2de^3(c+dx)^2}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^3,x]
```

```
[Out] -1/2*(a + b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + b*ArcSin[c + d*x])/(d*e^3*(c
+ d*x)^2)
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.02

method	result	size
derivativedivides	$\frac{-\frac{a}{2e^{3}(dx+c)^{2}}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^{2}}-\frac{\sqrt{1-(dx+c)^{2}}}{2(dx+c)}\right)}{e^{3}}}{d}$	62
default	$\frac{-\frac{a}{2e^{3}(dx+c)^{2}}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^{2}}-\frac{\sqrt{1-(dx+c)^{2}}}{2(dx+c)}\right)}{e^{3}}}{d}$	62
parts	$-\frac{a}{2e^{3}(dx+c)^{2}d}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^{2}}-\frac{\sqrt{1-(dx+c)^{2}}}{2(dx+c)}\right)}{e^{3}d}$	64

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
[Out] 1/d*(-1/2*a/e^3/(d*x+c)^2+b/e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(
1-(d*x+c)^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.67

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = \frac{ad^2x^2+2\,acdx-bc^2\arcsin(dx+c)-(bc^2dx+bc^3)\sqrt{-d^2x^2-2\,cdx-c^2+1}}{2\,(c^2d^3e^3x^2+2\,c^3d^2e^3x+c^4de^3)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="fricas")
[Out] 1/2*(a*d^2*x^2 + 2*a*c*d*x - b*c^2*arcsin(d*x + c) - (b*c^2*d*x + b*c^3)*sq
rt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(c^2*d^3*e^3*x^2 + 2*c^3*d^2*e^3*x + c^4*
d*e^3)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = \frac{\int \frac{a}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{b\operatorname{asin}(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**3,x)
[Out] (Integral(a/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(
b*asin(c + d*x)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/e**3
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 120 vs. 2(55) = 110.

Time = 0.27 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.97

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{1}{2}\,b\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}d}{d^3e^3x+cd^2e^3}+\frac{\arcsin\left(dx+c\right)}{d^3e^3x^2+2\,cd^2e^3x+c^2de^3}\right) - \frac{a}{2\left(d^3e^3x^2+2\,cd^2e^3x+c^2de^3\right)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*d/(d^3*e^3*x + c*d^2*e^3) + arcs
in(d*x + c)/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c^2*d*e^3)) - 1/2*a/(d^3*e^3*x^2
 + 2*c*d^2*e^3*x + c^2*d*e^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 231 vs. 2(55) = 110.

Time = 0.31 (sec) , antiderivative size = 231, normalized size of antiderivative = 3.79

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{b\arcsin\left(dx+c\right)}{4\,de^3} - \frac{(dx+c)^2b\arcsin\left(dx+c\right)}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin\left(dx+c\right)}{8\,(dx+c)^2de^3} - \frac{a}{4\,de^3} - \frac{(dx+c)^2a}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)b}{4\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)}{4\,(dx+c)de^3} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{8\,(dx+c)^2de^3}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="giac")
```

```
[Out] -1/4*b*arcsin(d*x + c)/(d*e^3) - 1/8*(d*x + c)^2*b*arcsin(d*x + c)/(d*e^3*(
sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2*arcsi
n(d*x + c)/((d*x + c)^2*d*e^3) - 1/4*a/(d*e^3) - 1/8*(d*x + c)^2*a/(d*e^3*(
sqrt(-(d*x + c)^2 + 1) + 1)^2) + 1/4*(d*x + c)*b/(d*e^3*(sqrt(-(d*x + c)^2
+ 1) + 1)) - 1/4*b*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^3) - 1/8*a*(
sqrt(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^3}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^3,x)
```

```
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^3, x)
```

3.185 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 88

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} - \frac{b\,\mathrm{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4}$$

```
[Out] 1/3*(-a-b*arcsin(d*x+c))/d/e^4/(d*x+c)^3-1/6*b*arctanh((1-(d*x+c)^2)^(1/2))
/d/e^4-1/6*b*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4889, 12, 4723, 272, 44, 65, 212}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} - \frac{b\,\mathrm{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4} - \frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^4,x]
```

```
[Out] -1/6*(b*Sqrt[1 - (c + d*x)^2])/(d*e^4*(c + d*x)^2) - (a + b*ArcSin[c + d*x]
)/(3*d*e^4*(c + d*x)^3) - (b*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(6*d*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{e^4x^4}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^4}\,dx, x, c+dx\right)}{de^4}$$

$$= -\frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int \frac{1}{x^3\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^4}$$

$$= -\frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x^2}\,dx, x, (c+dx)^2\right)}{6de^4}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x}\,dx, x, (c+dx)^2\right)}{12de^4}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} - \frac{b\text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, \sqrt{1-(c+dx)^2}\right)}{6de^4}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3} - \frac{b\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{2a+b(c+dx)\sqrt{1-(c+dx)^2}+2b\arcsin(c+dx)+b(c+dx)^3\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4(c+dx)^3}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^4,x]
[Out] -1/6*(2*a + b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + 2*b*ArcSin[c + d*x] + b*(c
+ d*x)^3*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(d*e^4*(c + d*x)^3)
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.89

method	result	size
derivativedivides	$\frac{-\frac{a}{3e^4(dx+c)^3}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4}}{d}$	78
default	$\frac{-\frac{a}{3e^4(dx+c)^3}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4}}{d}$	78
parts	$-\frac{a}{3e^4(dx+c)^3d}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4d}$	80

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3*a/e^4/(d*x+c)^3+b/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)-1/6/(d*x+c)^2
*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 209 vs. 2(78) = 156.

Time = 0.31 (sec) , antiderivative size = 209, normalized size of antiderivative = 2.38

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{4\,b\arcsin\left(dx+c\right)+\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(\sqrt{-d^2x^2-2\,cdx-c^2+1}+1\right)-\left(bd^3x^3+3\right.}{12\left(d^4e^4x^3+3\,cd^3e^4x\right.}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="fricas")
```

```
[Out] -1/12*(4*b*arcsin(d*x + c) + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) + 1) - (b*d^3*x^3 + 3*b*c*d^2*x^
2 + 3*b*c^2*d*x + b*c^3)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) - 1) + 2*sq
rt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(b*d*x + b*c) + 4*a)/(d^4*e^4*x^3 + 3*c*d^
3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

Sympy [F]

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^4} \, dx = \frac{\int \frac{a}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4} \, dx + \int \frac{b \operatorname{asin}(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4} \, dx}{e^4}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**4,x)
[Out] (Integral(a/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x*
*4), x) + Integral(b*asin(c + d*x)/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 +
4*c*d**3*x**3 + d**4*x**4), x))/e**4
```

Maxima [F]

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^4} \, dx = \int \frac{b \arcsin(dx + c) + a}{(dex + ce)^4} \, dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="maxima")
[Out] -1/3*(3*(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integ
rate(1/3*e^(1/2*log(d*x + c + 1) + 1/2*log(-d*x - c + 1))/(d^7*e^4*x^7 + 7*
c*d^6*e^4*x^6 + (21*c^2 - 1)*d^5*e^4*x^5 + 5*(7*c^3 - c)*d^4*e^4*x^4 + 5*(7
*c^4 - 2*c^2)*d^3*e^4*x^3 + (21*c^5 - 10*c^3)*d^2*e^4*x^2 + (7*c^6 - 5*c^4)
*d*e^4*x + (c^7 - c^5)*e^4 + (d^5*e^4*x^5 + 5*c*d^4*e^4*x^4 + (10*c^2 - 1)*
d^3*e^4*x^3 + (10*c^3 - 3*c)*d^2*e^4*x^2 + (5*c^4 - 3*c^2)*d*e^4*x + (c^5 -
 c^3)*e^4)*e^(log(d*x + c + 1) + log(-d*x - c + 1))), x) + arctan2(d*x + c,
 sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))*b/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 +
3*c^2*d^2*e^4*x + c^3*d*e^4) - 1/3*a/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2
*d^2*e^4*x + c^3*d*e^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 388 vs. $2(78) = 156$.

Time = 0.67 (sec) , antiderivative size = 388, normalized size of antiderivative = 4.41

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{(dx+c)^3 b\arcsin(dx+c)}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^3} - \frac{(dx+c)b\arcsin(dx+c)}{8\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin(dx+c)}{8\,(dx+c)de^4} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^3\arcsin(dx+c)}{24\,(dx+c)^3de^4} - \frac{b\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{6\,de^4} + \frac{b\log(|dx+c|)}{6\,de^4} - \frac{(dx+c)^3 a}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^3} + \frac{(dx+c)^2 b}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{(dx+c)a}{8\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)}{8\,(dx+c)de^4} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{24\,(dx+c)^2de^4} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^3}{24\,(dx+c)^3de^4}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="giac")
```

```
[Out] -1/24*(d*x + c)^3*b*arcsin(d*x + c)/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^3)
- 1/8*(d*x + c)*b*arcsin(d*x + c)/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)) - 1/
8*b*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d*e^4) - 1/24*b
*(sqrt(-(d*x + c)^2 + 1) + 1)^3*arcsin(d*x + c)/((d*x + c)^3*d*e^4) - 1/6*b
*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^4) + 1/6*b*log(abs(d*x + c))/(d*e^4)
- 1/24*(d*x + c)^3*a/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 1/24*(d*x + c
)^2*b/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*(d*x + c)*a/(d*e^4*(sqrt
(-(d*x + c)^2 + 1) + 1)) - 1/8*a*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*
```

```
e^4) - 1/24*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^4) - 1/24*a*(
sqrt(-(d*x + c)^2 + 1) + 1)^3/((d*x + c)^3*d*e^4)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^4}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^4,x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^4, x)
```

3.186 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 94

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = -\frac{b\sqrt{1-(c+dx)^2}}{12de^5(c+dx)^3} - \frac{b\sqrt{1-(c+dx)^2}}{6de^5(c+dx)} - \frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4}$$

```
[Out] 1/4*(-a-b*arcsin(d*x+c))/d/e^5/(d*x+c)^4-1/12*b*(1-(d*x+c)^2)^(1/2)/d/e^5/(
d*x+c)^3-1/6*b*(1-(d*x+c)^2)^(1/2)/d/e^5/(d*x+c)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4889, 12, 4723, 277, 270}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = -\frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4} - \frac{b\sqrt{1-(c+dx)^2}}{6de^5(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}}{12de^5(c+dx)^3}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^5,x]
```

```
[Out] -1/12*(b*Sqrt[1 - (c + d*x)^2])/(d*e^5*(c + d*x)^3) - (b*Sqrt[1 - (c + d*x)
^2])/(6*d*e^5*(c + d*x)) - (a + b*ArcSin[c + d*x])/(4*d*e^5*(c + d*x)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{e^5x^5}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^5}\,dx, x, c+dx\right)}{de^5}\\
&= -\frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4} + \frac{b\text{Subst}\left(\int \frac{1}{x^4\sqrt{1-x^2}}\,dx, x, c+dx\right)}{4de^5}\\
&= -\frac{b\sqrt{1-(c+dx)^2}}{12de^5(c+dx)^3} - \frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4} + \frac{b\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-x^2}}\,dx, x, c+dx\right)}{6de^5}\\
&= -\frac{b\sqrt{1-(c+dx)^2}}{12de^5(c+dx)^3} - \frac{b\sqrt{1-(c+dx)^2}}{6de^5(c+dx)} - \frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.67

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = -\frac{b(c+dx)\sqrt{1-(c+dx)^2}(1+2(c+dx)^2)+3(a+b\arcsin(c+dx))}{12de^5(c+dx)^4}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^5,x]
```

```
[Out] -1/12*(b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(1 + 2*(c + d*x)^2) + 3*(a + b*Arc
Sin[c + d*x]))/(d*e^5*(c + d*x)^4)
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.89

method	result	size
derivativedivides	$\frac{-\frac{a}{4e^5(dx+c)^4}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5}}{d}$	84
default	$\frac{-\frac{a}{4e^5(dx+c)^4}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5}}{d}$	84
parts	$-\frac{a}{4e^5(dx+c)^4d}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5d}$	86

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/4*a/e^5/(d*x+c)^4+b/e^5*(-1/4/(d*x+c)^4*arcsin(d*x+c)-1/12/(d*x+c)^
3*(1-(d*x+c)^2)^(1/2)-1/6/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 193 vs. $2(84) = 168$.

Time = 0.29 (sec) , antiderivative size = 193, normalized size of antiderivative = 2.05

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = \frac{3\,ad^4x^4+12\,acd^3x^3+18\,ac^2d^2x^2+12\,ac^3dx-3\,bc^4\arcsin(dx+c)-(2\,bc^4d^3x^3+6\,bc^5d^2x^2+2\,bc^7+bc^5}{12\,(c^4d^5e^5x^4+4\,c^5d^4e^5x^3+6\,c^6d^3e^5x^2+4\,c^7d^2e^5x+c^8de^5)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*d^4*x^4 + 12*a*c*d^3*x^3 + 18*a*c^2*d^2*x^2 + 12*a*c^3*d*x - 3*b*
c^4*arcsin(d*x + c) - (2*b*c^4*d^3*x^3 + 6*b*c^5*d^2*x^2 + 2*b*c^7 + b*c^5
+ (6*b*c^6 + b*c^4)*d*x)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(c^4*d^5*e^5*x
^4 + 4*c^5*d^4*e^5*x^3 + 6*c^6*d^3*e^5*x^2 + 4*c^7*d^2*e^5*x + c^8*d*e^5)
```

Sympy [F]

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^5}\, dx$$
$$= \frac{\int \frac{a}{c^5+5c^4dx+10c^3d^2x^2+10c^2d^3x^3+5cd^4x^4+d^5x^5}\, dx + \int \frac{b \operatorname{asin}{(c+dx)}}{c^5+5c^4dx+10c^3d^2x^2+10c^2d^3x^3+5cd^4x^4+d^5x^5}\, dx}{e^5}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**5,x)
```

```
[Out] (Integral(a/(c**5 + 5*c**4*d*x + 10*c**3*d**2*x**2 + 10*c**2*d**3*x**3 + 5*
c*d**4*x**4 + d**5*x**5), x) + Integral(b*asin(c + d*x)/(c**5 + 5*c**4*d*x
+ 10*c**3*d**2*x**2 + 10*c**2*d**3*x**3 + 5*c*d**4*x**4 + d**5*x**5), x))/e
**5
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 263 vs. $2(84) = 168$.

Time = 0.30 (sec) , antiderivative size = 263, normalized size of antiderivative = 2.80

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^5}\, dx$$
$$= \frac{1}{12} b \left(\frac{(2\,d^4x^4 + 8\,cd^3x^3 + 2\,c^4 + (12\,c^2d^2 - d^2)x^2 - c^2 + 2\,(4\,c^3d - cd)x - 1)d}{(d^5e^5x^3 + 3\,cd^4e^5x^2 + 3\,c^2d^3e^5x + c^3d^2e^5)\sqrt{dx+c+1}\sqrt{-dx-c+1}} - \frac{3 \text{ arcsi}}{d^5e^5x^4 + 4\,cd^4e^5x^3 + 6\,c}\right.$$
$$- \frac{a}{4\,(d^5e^5x^4 + 4\,cd^4e^5x^3 + 6\,c^2d^3e^5x^2 + 4\,c^3d^2e^5x + c^4de^5)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="maxima")
```

```
[Out] 1/12*b*((2*d^4*x^4 + 8*c*d^3*x^3 + 2*c^4 + (12*c^2*d^2 - d^2)*x^2 - c^2 + 2
*(4*c^3*d - c*d)*x - 1)*d/((d^5*e^5*x^3 + 3*c*d^4*e^5*x^2 + 3*c^2*d^3*e^5*x
 + c^3*d^2*e^5)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 3*arcsin(d*x + c)/(
d^5*e^5*x^4 + 4*c*d^4*e^5*x^3 + 6*c^2*d^3*e^5*x^2 + 4*c^3*d^2*e^5*x + c^4*d
*e^5)) - 1/4*a/(d^5*e^5*x^4 + 4*c*d^4*e^5*x^3 + 6*c^2*d^3*e^5*x^2 + 4*c^3*d
^2*e^5*x + c^4*d*e^5)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 447 vs. $2(84) = 168$.

Time = 0.34 (sec) , antiderivative size = 447, normalized size of antiderivative = 4.76

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = -\frac{1}{192}\,de^2\left(\frac{18\,b\arcsin\left(dx+c\right)}{d^2e^7} + \frac{3\left(dx+c\right)^4 b\arcsin\left(dx+c\right)}{d^2e^7\left(\sqrt{-\left(dx+c\right)^2+1}+1\right)^4} + \frac{12\left(dx+c\right)^2 b\arcsin\left(dx+c\right)}{d^2e^7\left(\sqrt{-\left(dx+c\right)^2+1}+1\right)^2} + \frac{12\,b\right.$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="giac")
```

```
[Out] -1/192*d*e^2*(18*b*arcsin(d*x + c)/(d^2*e^7) + 3*(d*x + c)^4*b*arcsin(d*x +
 c)/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^4) + 12*(d*x + c)^2*b*arcsin(d*x
+ c)/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^2) + 12*b*(sqrt(-(d*x + c)^2 + 1
) + 1)^2*arcsin(d*x + c)/((d*x + c)^2*d^2*e^7) + 3*b*(sqrt(-(d*x + c)^2 + 1
) + 1)^4*arcsin(d*x + c)/((d*x + c)^4*d^2*e^7) + 18*a/(d^2*e^7) + 3*(d*x +
c)^4*a/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^4) - 2*(d*x + c)^3*b/(d^2*e^7*
(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 12*(d*x + c)^2*a/(d^2*e^7*(sqrt(-(d*x + c
)^2 + 1) + 1)^2) - 18*(d*x + c)*b/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)) +
18*b*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d^2*e^7) + 12*a*(sqrt(-(d*x +
c)^2 + 1) + 1)^2/((d*x + c)^2*d^2*e^7) + 2*b*(sqrt(-(d*x + c)^2 + 1) + 1)^3
/((d*x + c)^3*d^2*e^7) + 3*a*(sqrt(-(d*x + c)^2 + 1) + 1)^4/((d*x + c)^4*d^
2*e^7))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{\left(c\,e+d\,e\,x\right)}^5}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^5,x)
```

```
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^5, x)
```

3.187 $\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^6} dx$

Optimal result

Integrand size = 21, antiderivative size = 121

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^6} dx = -\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4} - \frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} - \frac{3b\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{40de^6}$$

```
[Out] 1/5*(-a-b*arcsin(d*x+c))/d/e^6/(d*x+c)^5-3/40*b*arctanh((1-(d*x+c)^2)^(1/2)
)/d/e^6-1/20*b*(1-(d*x+c)^2)^(1/2)/d/e^6/(d*x+c)^4-3/40*b*(1-(d*x+c)^2)^(1/
2)/d/e^6/(d*x+c)^2
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4889, 12, 4723, 272, 44, 65, 212}

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^6} dx = -\frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} - \frac{3b\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{40de^6} - \frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2} - \frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^6,x]
```

```
[Out] -1/20*(b*Sqrt[1 - (c + d*x)^2])/(d*e^6*(c + d*x)^4) - (3*b*Sqrt[1 - (c + d*
x)^2])/(40*d*e^6*(c + d*x)^2) - (a + b*ArcSin[c + d*x])/(5*d*e^6*(c + d*x)^
5) - (3*b*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(40*d*e^6)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{e^6x^6}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^6}\,dx, x, c+dx\right)}{de^6}$$

$$= -\frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} + \frac{b\text{Subst}\left(\int \frac{1}{x^5\sqrt{1-x^2}}\,dx, x, c+dx\right)}{5de^6}$$

$$= -\frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} + \frac{b\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x^3}\,dx, x, (c+dx)^2\right)}{10de^6}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4} - \frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} + \frac{(3b)\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x^2}\,dx, x, (c+dx)^2\right)}{40de^6}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4} - \frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} + \frac{(3b)\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x}\,dx, x, (c+dx)^2\right)}{80de^6}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4} - \frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} - \frac{(3b)\text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, \sqrt{1-(c+dx)^2}\right)}{40de^6}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4} - \frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2} - \frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5} - \frac{3b\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{40de^6}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 0.09 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.54

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = -\frac{\frac{a+b\arcsin(c+dx)}{(c+dx)^5} + b\sqrt{1-(c+dx)^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2}, 3, \frac{3}{2}, 1-(c+dx)^2\right)}{5de^6}$$

[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^6,x]

[Out] -1/5*((a + b*ArcSin[c + d*x])/(c + d*x)^5 + b*Sqrt[1 - (c + d*x)^2]*Hypergeometric2F1[1/2, 3, 3/2, 1 - (c + d*x)^2])/(d*e^6)

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.83

method	result	size
derivativedivides	$\frac{-\frac{a}{5e^6(dx+c)^5}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\text{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6}}{d}$	100
default	$\frac{-\frac{a}{5e^6(dx+c)^5}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\text{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6}}{d}$	100
parts	$-\frac{a}{5e^6(dx+c)^5 d}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\text{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6 d}$	102

[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x,method=_RETURNVERBOSE)

[Out] 1/d*(-1/5*a/e^6/(d*x+c)^5+b/e^6*(-1/5/(d*x+c)^5*arcsin(d*x+c)-1/20/(d*x+c)^4*(1-(d*x+c)^2)^(1/2)-3/40/(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-3/40*arctanh(1/(1-(d*x+c)^2)^(1/2))))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 321 vs. 2(107) = 214.

Time = 0.34 (sec) , antiderivative size = 321, normalized size of antiderivative = 2.65

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = -\frac{16\,b\arcsin\left(dx+c\right)+3\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+10\,bc^3d^2x^2+5\,bc^4dx+bc^5\right)\log\left(\sqrt{-d^2x^2-2\,cd\right.}$$

[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="fricas")

[Out] -1/80*(16*b*arcsin(d*x + c) + 3*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10*b*c^3*d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) + 1) - 3*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10*b*c^3*

```
d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) - 1)
+ 2*(3*b*d^3*x^3 + 9*b*c*d^2*x^2 + 3*b*c^3 + (9*b*c^2 + 2*b)*d*x + 2*b*c)*s
qrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) + 16*a)/(d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 +
10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e^6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^6)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = \frac{\int \frac{a}{c^6+6c^5dx+15c^4d^2x^2+20c^3d^3x^3+15c^2d^4x^4+6cd^5x^5+d^6x^6}\,dx + \int \frac{b\,\mathrm{asin}\,(c+dx)}{c^6+6c^5dx+15c^4d^2x^2+20c^3d^3x^3+15c^2d^4x^4+6cd^5x^5+d^6x^6}\,dx}{e^6}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**6,x)
[Out] (Integral(a/(c**6 + 6*c**5*d*x + 15*c**4*d**2*x**2 + 20*c**3*d**3*x**3 + 15
*c**2*d**4*x**4 + 6*c*d**5*x**5 + d**6*x**6), x) + Integral(b*asin(c + d*x)
/(c**6 + 6*c**5*d*x + 15*c**4*d**2*x**2 + 20*c**3*d**3*x**3 + 15*c**2*d**4*
x**4 + 6*c*d**5*x**5 + d**6*x**6), x))/e**6
```

Maxima [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = \int \frac{b\arcsin(dx+c)+a}{(dex+ce)^6}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="maxima")
[Out] -1/5*(5*(d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 + 10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e^
6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^6)*integrate(1/5*e^(1/2*log(d*x + c + 1)
+ 1/2*log(-d*x - c + 1))/(d^9*e^6*x^9 + 9*c*d^8*e^6*x^8 + (36*c^2 - 1)*d^7*
e^6*x^7 + 7*(12*c^3 - c)*d^6*e^6*x^6 + 21*(6*c^4 - c^2)*d^5*e^6*x^5 + 7*(18
*c^5 - 5*c^3)*d^4*e^6*x^4 + 7*(12*c^6 - 5*c^4)*d^3*e^6*x^3 + 3*(12*c^7 - 7*
c^5)*d^2*e^6*x^2 + (9*c^8 - 7*c^6)*d*e^6*x + (c^9 - c^7)*e^6 + (d^7*e^6*x^7
 + 7*c*d^6*e^6*x^6 + (21*c^2 - 1)*d^5*e^6*x^5 + 5*(7*c^3 - c)*d^4*e^6*x^4 +
 5*(7*c^4 - 2*c^2)*d^3*e^6*x^3 + (21*c^5 - 10*c^3)*d^2*e^6*x^2 + (7*c^6 - 5
*c^4)*d*e^6*x + (c^7 - c^5)*e^6)*e^(log(d*x + c + 1) + log(-d*x - c + 1))),
 x) + arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))*b/(d^6*e^6*x^
5 + 5*c*d^5*e^6*x^4 + 10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e^6*x^2 + 5*c^4*d^2*e
^6*x + c^5*d*e^6) - 1/5*a/(d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 + 10*c^2*d^4*e^6*x
^3 + 10*c^3*d^3*e^6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^6)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 598 vs. $2(107) = 214$.

Time = 0.72 (sec) , antiderivative size = 598, normalized size of antiderivative = 4.94

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = -\frac{(dx+c)^5 b\arcsin(dx+c)}{160\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^5} - \frac{(dx+c)^3 b\arcsin(dx+c)}{32\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^3} - \frac{(dx+c)b\arcsin(dx+c)}{16\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin(dx+c)}{16\,(dx+c)de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^3\arcsin(dx+c)}{32\,(dx+c)^3de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^5\arcsin(dx+c)}{160\,(dx+c)^5de^6} - \frac{3\,b\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{40\,de^6} + \frac{3\,b\log(|dx+c|)}{40\,de^6} - \frac{(dx+c)^5 a}{160\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^5} + \frac{(dx+c)^4 b}{320\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^4} - \frac{(dx+c)^3 a}{32\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^3} + \frac{(dx+c)^2 b}{40\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{(dx+c)a}{16\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)}{16\,(dx+c)de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{40\,(dx+c)^2de^6} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^3}{32\,(dx+c)^3de^6}$$

$$b\left(\sqrt{-(dx+c)^2+1}+1\right)^4 \qquad a\left(\sqrt{-(dx+c)^2+1}+1\right)^5$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="giac")
```

```
[Out] -1/160*(d*x + c)^5*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^5)
 - 1/32*(d*x + c)^3*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^3
) - 1/16*(d*x + c)*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)) -
 1/16*b*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d*e^6) - 1/
32*b*(sqrt(-(d*x + c)^2 + 1) + 1)^3*arcsin(d*x + c)/((d*x + c)^3*d*e^6) - 1
/160*b*(sqrt(-(d*x + c)^2 + 1) + 1)^5*arcsin(d*x + c)/((d*x + c)^5*d*e^6) -
 3/40*b*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^6) + 3/40*b*log(abs(d*x + c))/
(d*e^6) - 1/160*(d*x + c)^5*a/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^5) + 1/32
0*(d*x + c)^4*b/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^4) - 1/32*(d*x + c)^3*a
/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 1/40*(d*x + c)^2*b/(d*e^6*(sqrt(-
(d*x + c)^2 + 1) + 1)^2) - 1/16*(d*x + c)*a/(d*e^6*(sqrt(-(d*x + c)^2 + 1)
+ 1)) - 1/16*a*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^6) - 1/40*b*(sqr
t(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^6) - 1/32*a*(sqrt(-(d*x + c)^2
+ 1) + 1)^3/((d*x + c)^3*d*e^6) - 1/320*b*(sqrt(-(d*x + c)^2 + 1) + 1)^4/((
d*x + c)^4*d*e^6) - 1/160*a*(sqrt(-(d*x + c)^2 + 1) + 1)^5/((d*x + c)^5*d*e
^6)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^6}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^6,x)
```

```
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^6, x)
```

3.188 $\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 203

$$\begin{aligned}\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx &= -\frac{16}{75}b^2e^4x-\frac{8b^2e^4(c+dx)^3}{225d}-\frac{2b^2e^4(c+dx)^5}{125d}\\&\quad+\frac{16be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d}\\&\quad+\frac{8be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d}\\&\quad+\frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d}\\&\quad+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}\end{aligned}$$

```
[Out] -16/75*b^2*e^4*x-8/225*b^2*e^4*(d*x+c)^3/d-2/125*b^2*e^4*(d*x+c)^5/d+1/5*e^
4*(d*x+c)^5*(a+b*arcsin(d*x+c))^2/d+16/75*b*e^4*(a+b*arcsin(d*x+c))*(1-(d*x
+c)^2)^(1/2)/d+8/75*b*e^4*(d*x+c)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)
/d+2/25*b*e^4*(d*x+c)^4*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4889, 12, 4723, 4795, 4767, 8, 30}

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}+\frac{2be^4\sqrt{1-(c+dx)^2}(c+dx)^4(a+b\arcsin(c+dx))}{25d}$$
$$+\frac{8be^4\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\arcsin(c+dx))}{75d}$$
$$+\frac{16be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d}$$
$$-\frac{2b^2e^4(c+dx)^5}{125d}-\frac{8b^2e^4(c+dx)^3}{225d}-\frac{16}{75}b^2e^4x$$

```
[In] Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (-16*b^2*e^4*x)/75 - (8*b^2*e^4*(c + d*x)^3)/(225*d) - (2*b^2*e^4*(c + d*x)
^5)/(125*d) + (16*b*e^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(75*
d) + (8*b*e^4*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(7
5*d) + (2*b*e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/
(25*d) + (e^4*(c + d*x)^5*(a + b*ArcSin[c + d*x])^2)/(5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^4x^4(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int x^4(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}-\frac{(2be^4)\,\text{Subst}\left(\int \frac{x^5(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{5d}\\
&= \frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d}+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}\\
&\quad-\frac{(8be^4)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{25d}-\frac{(2b^2e^4)\,\text{Subst}\left(\int x^4\,dx,x,c+dx\right)}{25d}
\end{aligned}
$$

$$= -\frac{2b^2e^4(c+dx)^5}{125d} + \frac{8be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d} + \frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d} - \frac{(16be^4)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{75d} - \frac{(8b^2e^4)\,\text{Subst}\left(\int x^2\,dx, x, c+dx\right)}{75d}$$

$$= -\frac{8b^2e^4(c+dx)^3}{225d} - \frac{2b^2e^4(c+dx)^5}{125d} + \frac{16be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d} + \frac{8be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d} + \frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d} - \frac{(16b^2e^4)\,\text{Subst}\left(\int 1\,dx, x, c+dx\right)}{75d}$$

$$= -\frac{16}{75}b^2e^4x - \frac{8b^2e^4(c+dx)^3}{225d} - \frac{2b^2e^4(c+dx)^5}{125d} + \frac{16be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d} + \frac{8be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d} + \frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.81

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx = \frac{e^4\left((c+dx)^5(a+b\arcsin(c+dx))^2 - \frac{2}{25}b\left(\frac{20}{9}b(c+dx)^3 + b(c+dx)^5 - \frac{20}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\,\mathrm{a}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^2,x]
[Out] (e^4*((c + d*x)^5*(a + b*ArcSin[c + d*x])^2 - (2*b*((20*b*(c + d*x)^3)/9 +
b*(c + d*x)^5 - (20*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x
]))/3 - 5*(c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (40*(
b*d*x - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3))/25))/(5*d)
```

Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.96

method	result
derivativedivides	$\frac{\frac{e^4a^2(dx+c)^5}{5}+e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\frac{16}{7}\right.}{d}$
default	$\frac{\frac{e^4a^2(dx+c)^5}{5}+e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\frac{16}{7}\right.}{d}$
parts	$\frac{e^4a^2(dx+c)^5}{5d}+\frac{e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\right.}{d}$

```
[In] int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/5*e^4*a^2*(d*x+c)^5+e^4*b^2*(1/5*(d*x+c)^5*arcsin(d*x+c)^2+2/75*arcs
in(d*x+c)*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-2/125*(d*x+c)^5-8
/225*(d*x+c)^3-16/75*d*x-16/75*c)+2*e^4*a*b*(1/5*(d*x+c)^5*arcsin(d*x+c)+1/
25*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+8/75*(1
-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 567 vs. 2(183) = 366.

Time = 0.28 (sec) , antiderivative size = 567, normalized size of antiderivative = 2.79

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{9\,(25\,a^2-2\,b^2)d^5e^4x^5+45\,(25\,a^2-2\,b^2)cd^4e^4x^4+10\,(9\,(25\,a^2-2\,b^2)c^2-4\,b^2)d^3e^4x^3+30\,(3\,(25\,a^2-2\,b}{}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/1125*(9*(25*a^2 - 2*b^2)*d^5*e^4*x^5 + 45*(25*a^2 - 2*b^2)*c*d^4*e^4*x^4
+ 10*(9*(25*a^2 - 2*b^2)*c^2 - 4*b^2)*d^3*e^4*x^3 + 30*(3*(25*a^2 - 2*b^2)*
c^3 - 4*b^2*c)*d^2*e^4*x^2 + 15*(3*(25*a^2 - 2*b^2)*c^4 - 8*b^2*c^2 - 16*b^
2)*d*e^4*x + 225*(b^2*d^5*e^4*x^5 + 5*b^2*c*d^4*e^4*x^4 + 10*b^2*c^2*d^3*e^
4*x^3 + 10*b^2*c^3*d^2*e^4*x^2 + 5*b^2*c^4*d*e^4*x + b^2*c^5*e^4)*arcsin(d*
x + c)^2 + 450*(a*b*d^5*e^4*x^5 + 5*a*b*c*d^4*e^4*x^4 + 10*a*b*c^2*d^3*e^4*
x^3 + 10*a*b*c^3*d^2*e^4*x^2 + 5*a*b*c^4*d*e^4*x + a*b*c^5*e^4)*arcsin(d*x
+ c) + 30*(3*a*b*d^4*e^4*x^4 + 12*a*b*c*d^3*e^4*x^3 + 2*(9*a*b*c^2 + 2*a*b)
*d^2*e^4*x^2 + 4*(3*a*b*c^3 + 2*a*b*c)*d*e^4*x + (3*a*b*c^4 + 4*a*b*c^2 + 8
*a*b)*e^4 + (3*b^2*d^4*e^4*x^4 + 12*b^2*c*d^3*e^4*x^3 + 2*(9*b^2*c^2 + 2*b^
2)*d^2*e^4*x^2 + 4*(3*b^2*c^3 + 2*b^2*c)*d*e^4*x + (3*b^2*c^4 + 4*b^2*c^2 +
 8*b^2)*e^4)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1268 vs. 2(184) = 368.

Time = 0.64 (sec) , antiderivative size = 1268, normalized size of antiderivative = 6.25

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*c**4*e**4*x + 2*a**2*c**3*d*e**4*x**2 + 2*a**2*c**2*d**2*e*
*4*x**3 + a**2*c*d**3*e**4*x**4 + a**2*d**4*e**4*x**5/5 + 2*a*b*c**5*e**4*a
sin(c + d*x)/(5*d) + 2*a*b*c**4*e**4*x*asin(c + d*x) + 2*a*b*c**4*e**4*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 4*a*b*c**3*d*e**4*x**2*asin(c +
d*x) + 8*a*b*c**3*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*a*b*c
**2*d**2*e**4*x**3*asin(c + d*x) + 12*a*b*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c
*d*x - d**2*x**2 + 1)/25 + 8*a*b*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/(75*d) + 2*a*b*c*d**3*e**4*x**4*asin(c + d*x) + 8*a*b*c*d**2*e**4*x**
3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 16*a*b*c*e**4*x*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)/75 + 2*a*b*d**4*e**4*x**5*asin(c + d*x)/5 + 2*a*b*d
**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 8*a*b*d*e**4*x**2*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + 16*a*b*e**4*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)/(75*d) + b**2*c**5*e**4*asin(c + d*x)**2/(5*d) + b**2*c**
4*e**4*x*asin(c + d*x)**2 - 2*b**2*c**4*e**4*x/25 + 2*b**2*c**4*e**4*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(25*d) + 2*b**2*c**3*d*e**4*x
**2*asin(c + d*x)**2 - 4*b**2*c**3*d*e**4*x**2/25 + 8*b**2*c**3*e**4*x*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 + 2*b**2*c**2*d**2*e**4*
x**3*asin(c + d*x)**2 - 4*b**2*c**2*d**2*e**4*x**3/25 + 12*b**2*c**2*d*e**4
*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 - 8*b**2*c**2*
e**4*x/75 + 8*b**2*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c +
 d*x)/(75*d) + b**2*c*d**3*e**4*x**4*asin(c + d*x)**2 - 2*b**2*c*d**3*e**4*
x**4/25 + 8*b**2*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asi
n(c + d*x)/25 - 8*b**2*c*d*e**4*x**2/75 + 16*b**2*c*e**4*x*sqrt(-c**2 - 2*c
*d*x - d**2*x**2 + 1)*asin(c + d*x)/75 + b**2*d**4*e**4*x**5*asin(c + d*x)*
*2/5 - 2*b**2*d**4*e**4*x**5/125 + 2*b**2*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d
*x - d**2*x**2 + 1)*asin(c + d*x)/25 - 8*b**2*d**2*e**4*x**3/225 + 8*b**2*d
*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/75 - 16*b**2
*e**4*x/75 + 16*b**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*
x)/(75*d), Ne(d, 0)), (c**4*e**4*x*(a + b*asin(c))**2, True))
```

Maxima [F]

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^4(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/5*a^2*d^4*e^4*x^5 + a^2*c*d^3*e^4*x^4 + 2*a^2*c^2*d^2*e^4*x^3 + 2*a^2*c^3
*d*e^4*x^2 + 2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt
(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 -
 (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqr
t(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*c^3*d*e^4 + 2/3*(6*x^3*arcsin(d
*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-
(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (
c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt
(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a*b*c^2*d^2*e^4 + 1/12*(24*x
^4*arcsin(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqr
t(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/s
qrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c
^2*x/d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*
d^2))/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^
2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d
)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*(c^2 - 1)*c/d^5)*d)*a*b*c*d^3*e^4 + 1/300*(120*x^5*arcsin(d*x + c) + (24*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d^2*x^2 - 2*c*d*x - c
^2 + 1)*c*x^3/d^3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x^2/d^4 - 94
5*c^5*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 315*sqrt(-
d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3*x/d^5 - 32*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
 1)*(c^2 - 1)*x^2/d^4 + 1050*(c^2 - 1)*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d
^2 - (c^2 - 1)*d^2))/d^6 + 945*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^4/d^6 +
 161*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c*x/d^5 - 225*(c^2 - 1)^2
*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 735*sqrt(-d^2
*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c^2/d^6 + 64*sqrt(-d^2*x^2 - 2*c*d*x -
c^2 + 1)*(c^2 - 1)^2/d^6)*d)*a*b*d^4*e^4 + a^2*c^4*e^4*x + 2*((d*x + c)*arc
sin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a*b*c^4*e^4/d + 1/5*(b^2*d^4*e^4*x^5
 + 5*b^2*c*d^3*e^4*x^4 + 10*b^2*c^2*d^2*e^4*x^3 + 10*b^2*c^3*d*e^4*x^2 + 5*
b^2*c^4*e^4*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + i
ntegrate(2/5*(b^2*d^5*e^4*x^5 + 5*b^2*c*d^4*e^4*x^4 + 10*b^2*c^2*d^3*e^4*x^
3 + 10*b^2*c^3*d^2*e^4*x^2 + 5*b^2*c^4*d*e^4*x)*sqrt(d*x + c + 1)*sqrt(-d*x
 - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d^2*x^2 +
 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 443 vs. $2(183) = 366$.

Time = 0.32 (sec) , antiderivative size = 443, normalized size of antiderivative = 2.18

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{(dx+c)^5a^2e^4}{5\,d} + \frac{\left((dx+c)^2-1\right)^2(dx+c)b^2e^4\arcsin(dx+c)^2}{5\,d} + \frac{2\left((dx+c)^2-1\right)^2(dx+c)abe^4\arcsin(dx+c)}{5\,d} + \frac{2\left((dx+c)^2-1\right)(dx+c)b^2e^4\arcsin(dx+c)^2}{5\,d} + \frac{2\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}b^2e^4\arcsin(dx+c)}{25\,d} - \frac{2\left((dx+c)^2-1\right)^2(dx+c)b^2e^4}{125\,d} + \frac{4\left((dx+c)^2-1\right)(dx+c)abe^4\arcsin(dx+c)}{5\,d} + \frac{(dx+c)b^2e^4\arcsin(dx+c)^2}{5\,d} + \frac{2\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}abe^4}{25\,d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^2e^4\arcsin(dx+c)}{15\,d} - \frac{76\left((dx+c)^2-1\right)(dx+c)b^2e^4}{1125\,d} + \frac{2(dx+c)abe^4\arcsin(dx+c)}{5\,d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}abe^4}{15\,d} + \frac{2\sqrt{-(dx+c)^2+1}b^2e^4\arcsin(dx+c)}{5\,d} - \frac{298\,(dx+c)b^2e^4}{1125\,d} + \frac{2\sqrt{-(dx+c)^2+1}abe^4}{5\,d}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/5*(d*x + c)^5*a^2*e^4/d + 1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b^2*e^4*arcsi
n(d*x + c)^2/d + 2/5*((d*x + c)^2 - 1)^2*(d*x + c)*a*b*e^4*arcsin(d*x + c)/
d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^4*arcsin(d*x + c)^2/d + 2/25*((d*
x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^2*e^4*arcsin(d*x + c)/d - 2/125*((
d*x + c)^2 - 1)^2*(d*x + c)*b^2*e^4/d + 4/5*((d*x + c)^2 - 1)*(d*x + c)*a*b
*e^4*arcsin(d*x + c)/d + 1/5*(d*x + c)*b^2*e^4*arcsin(d*x + c)^2/d + 2/25*(
(d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a*b*e^4/d - 4/15*(-(d*x + c)^2 +
1)^(3/2)*b^2*e^4*arcsin(d*x + c)/d - 76/1125*((d*x + c)^2 - 1)*(d*x + c)*b^
2*e^4/d + 2/5*(d*x + c)*a*b*e^4*arcsin(d*x + c)/d - 4/15*(-(d*x + c)^2 + 1)
^(3/2)*a*b*e^4/d + 2/5*sqrt(-(d*x + c)^2 + 1)*b^2*e^4*arcsin(d*x + c)/d - 2
98/1125*(d*x + c)*b^2*e^4/d + 2/5*sqrt(-(d*x + c)^2 + 1)*a*b*e^4/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^4\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^2\,dx$$

```
[In] int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^2, x)
```

3.189 $\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 176

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx &= -\frac{3b^2e^3(c+dx)^2}{32d}-\frac{b^2e^3(c+dx)^4}{32d}+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{16d}\\ &\quad+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{8d}\\ &\quad-\frac{3e^3(a+b\arcsin(c+dx))^2}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}\end{aligned}$$

```
[Out] -3/32*b^2*e^3*(d*x+c)^2/d-1/32*b^2*e^3*(d*x+c)^4/d-3/32*e^3*(a+b*arcsin(d*x
+c))^2/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^2/d+3/16*b*e^3*(d*x+c)*(a+b*
arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+1/8*b*e^3*(d*x+c)^3*(a+b*arcsin(d*x+c)
)*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 12, 4723, 4795, 4737, 30}

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx &= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}+\frac{be^3\sqrt{1-(c+dx)^2}(c+dx)^3(a+b\arcsin(c+dx))}{8d}\\ &\quad+\frac{3be^3\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+dx))}{16d}\\ &\quad-\frac{3e^3(a+b\arcsin(c+dx))^2}{32d}-\frac{b^2e^3(c+dx)^4}{32d}-\frac{3b^2e^3(c+dx)^2}{32d}\end{aligned}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (-3*b^2*e^3*(c + d*x)^2)/(32*d) - (b^2*e^3*(c + d*x)^4)/(32*d) + (3*b*e^3*(
c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(16*d) + (b*e^3*(c
+ d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(8*d) - (3*e^3*(a +
 b*ArcSin[c + d*x])^2)/(32*d) + (e^3*(c + d*x)^4*(a + b*ArcSin[c + d*x])^2)
/(4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}-\frac{(be^3)\,\text{Subst}\left(\int \frac{x^4(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\\
&= \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{8d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}\\
&\quad-\frac{(3be^3)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}-\frac{(b^2e^3)\,\text{Subst}\left(\int x^3\,dx,x,c+dx\right)}{8d}\\
&= -\frac{b^2e^3(c+dx)^4}{32d}+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{16d}\\
&\quad+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{8d}\\
&\quad+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}\\
&\quad-\frac{(3be^3)\,\text{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{16d}-\frac{(3b^2e^3)\,\text{Subst}\left(\int x\,dx,x,c+dx\right)}{16d}\\
&= -\frac{3b^2e^3(c+dx)^2}{32d}-\frac{b^2e^3(c+dx)^4}{32d}\\
&\quad+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{16d}\\
&\quad+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{8d}\\
&\quad-\frac{3e^3(a+b\arcsin(c+dx))^2}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 142, normalized size of antiderivative = 0.81

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{e^3\left((c+dx)^4(a+b\arcsin(c+dx))^2+\frac{1}{8}\left(-b^2(c+dx)^4+4b(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx)\right.\right.}{4d}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (e^3*((c + d*x)^4*(a + b*ArcSin[c + d*x])^2 + (-(b^2*(c + d*x)^4) + 4*b*(c
+ d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) - 3*(b^2*(c + d*x)^2
 - 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (a + b*Arc
Sin[c + d*x])^2))/8))/(4*d)
```

Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.15

method	result
derivativedivides	$\frac{\frac{e^3a^2(dx+c)^4}{4}+e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}+\right.}{}$
default	$\frac{\frac{e^3a^2(dx+c)^4}{4}+e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}+\right.}{}$
parts	$\frac{e^3a^2(dx+c)^4}{4d}+\frac{e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}\right.}{d}$

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/4*e^3*a^2*(d*x+c)^4+e^3*b^2*(1/4*(d*x+c)^4*arcsin(d*x+c)^2-1/16*arcs
in(d*x+c)*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3
*arcsin(d*x+c))+3/32*arcsin(d*x+c)^2-1/128*(2*(d*x+c)^2+3)^2)+2*e^3*a*b*(1/
4*(d*x+c)^4*arcsin(d*x+c)+1/16*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(
1-(d*x+c)^2)^(1/2)-3/32*arcsin(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 442 vs. 2(160) = 320.

Time = 0.27 (sec) , antiderivative size = 442, normalized size of antiderivative = 2.51

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{(8\,a^2-b^2)d^4e^3x^4+4\,(8\,a^2-b^2)cd^3e^3x^3+3\,(2\,(8\,a^2-b^2)c^2-b^2)d^2e^3x^2+2\,(2\,(8\,a^2-b^2)c^3-3\,b^2c)de^3x+}{}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/32*((8*a^2 - b^2)*d^4*e^3*x^4 + 4*(8*a^2 - b^2)*c*d^3*e^3*x^3 + 3*(2*(8*a
^2 - b^2)*c^2 - b^2)*d^2*e^3*x^2 + 2*(2*(8*a^2 - b^2)*c^3 - 3*b^2*c)*d*e^3*
x + (8*b^2*d^4*e^3*x^4 + 32*b^2*c*d^3*e^3*x^3 + 48*b^2*c^2*d^2*e^3*x^2 + 32
*b^2*c^3*d*e^3*x + (8*b^2*c^4 - 3*b^2)*e^3)*arcsin(d*x + c)^2 + 2*(8*a*b*d^
4*e^3*x^4 + 32*a*b*c*d^3*e^3*x^3 + 48*a*b*c^2*d^2*e^3*x^2 + 32*a*b*c^3*d*e^
3*x + (8*a*b*c^4 - 3*a*b)*e^3)*arcsin(d*x + c) + 2*(2*a*b*d^3*e^3*x^3 + 6*a
*b*c*d^2*e^3*x^2 + 3*(2*a*b*c^2 + a*b)*d*e^3*x + (2*a*b*c^3 + 3*a*b*c)*e^3
+ (2*b^2*d^3*e^3*x^3 + 6*b^2*c*d^2*e^3*x^2 + 3*(2*b^2*c^2 + b^2)*d*e^3*x +
(2*b^2*c^3 + 3*b^2*c)*e^3)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 916 vs. 2(155) = 310.

Time = 0.49 (sec) , antiderivative size = 916, normalized size of antiderivative = 5.20

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$
$$= \begin{cases} a^2c^3e^3x+\frac{3a^2c^2de^3x^2}{2}+a^2cd^2e^3x^3+\frac{a^2d^3e^3x^4}{4}+\frac{abc^4e^3\operatorname{asin}(c+dx)}{2d}+2abc^3e^3x\operatorname{asin}(c+dx)+\frac{abc^3e^3\sqrt{-c^2-2cdx-d^2}}{8d} \\ c^3e^3x(a+b\operatorname{asin}(c))^2 \end{cases}$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*c**3*e**3*x + 3*a**2*c**2*d*e**3*x**2/2 + a**2*c*d**2*e**3*
x**3 + a**2*d**3*e**3*x**4/4 + a*b*c**4*e**3*asin(c + d*x)/(2*d) + 2*a*b*c*
*3*e**3*x*asin(c + d*x) + a*b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
1)/(8*d) + 3*a*b*c**2*d*e**3*x**2*asin(c + d*x) + 3*a*b*c**2*e**3*x*sqrt(-c
**2 - 2*c*d*x - d**2*x**2 + 1)/8 + 2*a*b*c*d**2*e**3*x**3*asin(c + d*x) + 3
*a*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 + 3*a*b*c*e**3*s
qrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(16*d) + a*b*d**3*e**3*x**4*asin(c + d
*x)/2 + a*b*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 + 3*a*b*
```

```
e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 - 3*a*b*e**3*asin(c + d*x)/
(16*d) + b**2*c**4*e**3*asin(c + d*x)**2/(4*d) + b**2*c**3*e**3*x*asin(c +
d*x)**2 - b**2*c**3*e**3*x/8 + b**2*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x
**2 + 1)*asin(c + d*x)/(8*d) + 3*b**2*c**2*d*e**3*x**2*asin(c + d*x)**2/2 -
 3*b**2*c**2*d*e**3*x**2/16 + 3*b**2*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**
2*x**2 + 1)*asin(c + d*x)/8 + b**2*c*d**2*e**3*x**3*asin(c + d*x)**2 - b**2
*c*d**2*e**3*x**3/8 + 3*b**2*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)*asin(c + d*x)/8 - 3*b**2*c*e**3*x/16 + 3*b**2*c*e**3*sqrt(-c**2 - 2*c
*d*x - d**2*x**2 + 1)*asin(c + d*x)/(16*d) + b**2*d**3*e**3*x**4*asin(c + d
*x)**2/4 - b**2*d**3*e**3*x**4/32 + b**2*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*
x - d**2*x**2 + 1)*asin(c + d*x)/8 - 3*b**2*d*e**3*x**2/32 + 3*b**2*e**3*x*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/16 - 3*b**2*e**3*asin(c
 + d*x)**2/(32*d), Ne(d, 0)), (c**3*e**3*x*(a + b*asin(c))**2, True))
```

Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^3(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
[Out] 1/4*a^2*d^3*e^3*x^4 + a^2*c*d^2*e^3*x^3 + 3/2*a^2*c^2*d*e^3*x^2 + 3/2*(2*x^
2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)
*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(
d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1)*c/d^3))*a*b*c^2*d*e^3 + 1/3*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(
-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c
^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3
 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 +
 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*(c^2 - 1)/d^4))*a*b*c*d^2*e^3 + 1/48*(24*x^4*arcsin(d*x + c) + (
6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2*c*d*x -
 c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1
)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*(c^2 - 1
)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 105*sqrt(-
d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2
- 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)*d)*
a*b*d^3*e^3 + a^2*c^3*e^3*x + 2*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c
)^2 + 1))*a*b*c^3*e^3/d + 1/4*(b^2*d^3*e^3*x^4 + 4*b^2*c*d^2*e^3*x^3 + 6*b^
2*c^2*d*e^3*x^2 + 4*b^2*c^3*e^3*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(
-d*x - c + 1))^2 + integrate(1/2*(b^2*d^4*e^3*x^4 + 4*b^2*c*d^3*e^3*x^3 + 6
*b^2*c^2*d^2*e^3*x^2 + 4*b^2*c^3*d*e^3*x)*sqrt(d*x + c + 1)*sqrt(-d*x - c +
 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d^2*x^2 + 2*c*d
*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 342 vs. $2(160) = 320$.

Time = 0.32 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.94

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx = \frac{(dx+c)^4a^2e^3}{4\,d} + \frac{\left((dx+c)^2-1\right)^2b^2e^3\arcsin\left(dx+c\right)^2}{4\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^2e^3\arcsin\left(dx+c\right)}{8\,d} + \frac{\left((dx+c)^2-1\right)^2abe^3\arcsin\left(dx+c\right)}{2\,d} + \frac{\left((dx+c)^2-1\right)b^2e^3\arcsin\left(dx+c\right)^2}{2\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)abe^3}{8\,d} + \frac{5\sqrt{-(dx+c)^2+1}(dx+c)b^2e^3\arcsin\left(dx+c\right)}{16\,d} - \frac{\left((dx+c)^2-1\right)^2b^2e^3}{32\,d} + \frac{\left((dx+c)^2-1\right)abe^3\arcsin\left(dx+c\right)}{d} + \frac{5\,b^2e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{5\sqrt{-(dx+c)^2+1}(dx+c)abe^3}{16\,d} - \frac{5\left((dx+c)^2-1\right)b^2e^3}{32\,d} + \frac{5\,abe^3\arcsin\left(dx+c\right)}{16\,d} - \frac{17\,b^2e^3}{256\,d}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/4*(d*x + c)^4*a^2*e^3/d + 1/4*((d*x + c)^2 - 1)^2*b^2*e^3*arcsin(d*x + c)
^2/d - 1/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b^2*e^3*arcsin(d*x + c)/d + 1
/2*((d*x + c)^2 - 1)^2*a*b*e^3*arcsin(d*x + c)/d + 1/2*((d*x + c)^2 - 1)*b^
2*e^3*arcsin(d*x + c)^2/d - 1/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b*e^3/
d + 5/16*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^2*e^3*arcsin(d*x + c)/d - 1/32*
((d*x + c)^2 - 1)^2*b^2*e^3/d + ((d*x + c)^2 - 1)*a*b*e^3*arcsin(d*x + c)/d
 + 5/32*b^2*e^3*arcsin(d*x + c)^2/d + 5/16*sqrt(-(d*x + c)^2 + 1)*(d*x + c)
```

```
*a*b*e^3/d - 5/32*((d*x + c)^2 - 1)*b^2*e^3/d + 5/16*a*b*e^3*arcsin(d*x + c
)/d - 17/256*b^2*e^3/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^2, x)
```

3.190 $\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 140

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx = -\frac{4}{9}b^2e^2x-\frac{2b^2e^2(c+dx)^3}{27d}+\frac{4be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}+\frac{2be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d}$$

```
[Out] -4/9*b^2*e^2*x-2/27*b^2*e^2*(d*x+c)^3/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c
))^2/d+4/9*b*e^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+2/9*b*e^2*(d*x+c
)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4889, 12, 4723, 4795, 4767, 8, 30}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx = \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d}+\frac{2be^2\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\arcsin(c+dx))}{9d}+\frac{4be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}-\frac{2b^2e^2(c+dx)^3}{27d}-\frac{4}{9}b^2e^2x$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (-4*b^2*e^2*x)/9 - (2*b^2*e^2*(c + d*x)^3)/(27*d) + (4*b*e^2*Sqrt[1 - (c +
d*x)^2]*(a + b*ArcSin[c + d*x]))/(9*d) + (2*b*e^2*(c + d*x)^2*Sqrt[1 - (c +
 d*x)^2]*(a + b*ArcSin[c + d*x]))/(9*d) + (e^2*(c + d*x)^3*(a + b*ArcSin[c
+ d*x])^2)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d} - \frac{(2be^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3d}\\
&= \frac{2be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d}\\
&\quad - \frac{(4be^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{9d} - \frac{(2b^2e^2)\,\text{Subst}\left(\int x^2\,dx,x,c+dx\right)}{9d}\\
&= -\frac{2b^2e^2(c+dx)^3}{27d} + \frac{4be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}\\
&\quad + \frac{2be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}\\
&\quad + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d} - \frac{(4b^2e^2)\,\text{Subst}\left(\int 1\,dx,x,c+dx\right)}{9d}\\
&= -\frac{4}{9}b^2e^2x - \frac{2b^2e^2(c+dx)^3}{27d} + \frac{4be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}\\
&\quad + \frac{2be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{9d}\\
&\quad + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{e^2\left((c+dx)^3(a+b\arcsin(c+dx))^2 - \frac{2}{9}b\left(6bdx + b(c+dx)^3 - 6\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx)) - 3(\ldots\right.\right.}{3d}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^2,x]
[Out] (e^2*((c + d*x)^3*(a + b*ArcSin[c + d*x])^2 - (2*b*(6*b*d*x + b*(c + d*x)^3
 - 6*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) - 3*(c + d*x)^2*Sqrt[1 -
 (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/9))/(3*d)
```

Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.09

method	result
derivativedivides	$\frac{\frac{a^2e^2(dx+c)^3}{3}+e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)+2e^2ab\left(\frac{(dx+\cdots}{}\right.}{d}$
default	$\frac{\frac{a^2e^2(dx+c)^3}{3}+e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)+2e^2ab\left(\frac{(dx+\cdots}{}\right.}{d}$
parts	$\frac{a^2e^2(dx+c)^3}{3d}+\frac{e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)}{d}+\frac{2e^2ab\left(\cdots\right.}{}$

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/3*a^2*e^2*(d*x+c)^3+e^2*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcsi
n(d*x+c)*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+2*
e^2*a*b*(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2/9*
(1-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 307 vs. 2(126) = 252.

Time = 0.26 (sec) , antiderivative size = 307, normalized size of antiderivative = 2.19

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{(9a^2-2b^2)d^3e^2x^3+3(9a^2-2b^2)cd^2e^2x^2+3((9a^2-2b^2)c^2-4b^2)de^2x+9(b^2d^3e^2x^3+3b^2cd^2e^2x^2+\cdots}{}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/27*((9*a^2 - 2*b^2)*d^3*e^2*x^3 + 3*(9*a^2 - 2*b^2)*c*d^2*e^2*x^2 + 3*((9
*a^2 - 2*b^2)*c^2 - 4*b^2)*d*e^2*x + 9*(b^2*d^3*e^2*x^3 + 3*b^2*c*d^2*e^2*x
^2 + 3*b^2*c^2*d*e^2*x + b^2*c^3*e^2)*arcsin(d*x + c)^2 + 18*(a*b*d^3*e^2*x
^3 + 3*a*b*c*d^2*e^2*x^2 + 3*a*b*c^2*d*e^2*x + a*b*c^3*e^2)*arcsin(d*x + c)
 + 6*(a*b*d^2*e^2*x^2 + 2*a*b*c*d*e^2*x + (a*b*c^2 + 2*a*b)*e^2 + (b^2*d^2*
e^2*x^2 + 2*b^2*c*d*e^2*x + (b^2*c^2 + 2*b^2)*e^2)*arcsin(d*x + c))*sqrt(-d
^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 610 vs. $2(126) = 252$.

Time = 0.31 (sec) , antiderivative size = 610, normalized size of antiderivative = 4.36

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \begin{cases} a^2c^2e^2x + a^2cde^2x^2 + \frac{a^2d^2e^2x^3}{3} + \frac{2abc^3e^2\operatorname{asin}(c+dx)}{3d} + 2abc^2e^2x\operatorname{asin}(c+dx) + \frac{2abc^2e^2\sqrt{-c^2-2cdx-d^2x^2+1}}{9d} + 2abc \\ c^2e^2x(a+b\operatorname{asin}(c))^2 \end{cases}$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*c**2*e**2*x + a**2*c*d*e**2*x**2 + a**2*d**2*e**2*x**3/3 +
2*a*b*c**3*e**2*asin(c + d*x)/(3*d) + 2*a*b*c**2*e**2*x*asin(c + d*x) + 2*a
*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + 2*a*b*c*d*e**2*x
**2*asin(c + d*x) + 4*a*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9
+ 2*a*b*d**2*e**2*x**3*asin(c + d*x)/3 + 2*a*b*d*e**2*x**2*sqrt(-c**2 - 2*c
*d*x - d**2*x**2 + 1)/9 + 4*a*b*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/
(9*d) + b**2*c**3*e**2*asin(c + d*x)**2/(3*d) + b**2*c**2*e**2*x*asin(c + d
*x)**2 - 2*b**2*c**2*e**2*x/9 + 2*b**2*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**
2*x**2 + 1)*asin(c + d*x)/(9*d) + b**2*c*d*e**2*x**2*asin(c + d*x)**2 - 2*b
**2*c*d*e**2*x**2/9 + 4*b**2*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)
*asin(c + d*x)/9 + b**2*d**2*e**2*x**3*asin(c + d*x)**2/3 - 2*b**2*d**2*e**
2*x**3/27 + 2*b**2*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
 + d*x)/9 - 4*b**2*e**2*x/9 + 4*b**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
+ 1)*asin(c + d*x)/(9*d), Ne(d, 0)), (c**2*e**2*x*(a + b*asin(c))**2, True)
)
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*d^2*e^2*x^3 + a^2*c*d*e^2*x^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*a
rcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c
^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*c*d*e^
2 + 1/9*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^
2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5
*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x
+ c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^
```

```
2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a*b*d
^2*e^2 + a^2*c^2*e^2*x + 2*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 +
 1))*a*b*c^2*e^2/d + 1/3*(b^2*d^2*e^2*x^3 + 3*b^2*c*d*e^2*x^2 + 3*b^2*c^2*e
^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + integrate(
2/3*(b^2*d^3*e^2*x^3 + 3*b^2*c*d^2*e^2*x^2 + 3*b^2*c^2*d*e^2*x)*sqrt(d*x +
c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c
+ 1))/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 274 vs. $2(126) = 252$.

Time = 0.31 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.96

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{\left((dx+c)^2-1\right)(dx+c)b^2e^2\arcsin\left(dx+c\right)^2}{3\,d} + \frac{(dx+c)^3a^2e^2}{3\,d} + \frac{2\left((dx+c)^2-1\right)(dx+c)abe^2\arcsin\left(dx+c\right)}{3\,d} + \frac{(dx+c)b^2e^2\arcsin\left(dx+c\right)^2}{3\,d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^2e^2\arcsin\left(dx+c\right)}{9\,d} - \frac{2\left((dx+c)^2-1\right)(dx+c)b^2e^2}{27\,d} + \frac{2\,(dx+c)abe^2\arcsin\left(dx+c\right)}{3\,d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}abe^2}{9\,d} + \frac{2\sqrt{-(dx+c)^2+1}b^2e^2\arcsin\left(dx+c\right)}{3\,d} - \frac{14\,(dx+c)b^2e^2}{27\,d} + \frac{2\sqrt{-(dx+c)^2+1}abe^2}{3\,d}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/3*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^2*arcsin(d*x + c)^2/d + 1/3*(d*x + c)
^3*a^2*e^2/d + 2/3*((d*x + c)^2 - 1)*(d*x + c)*a*b*e^2*arcsin(d*x + c)/d +
1/3*(d*x + c)*b^2*e^2*arcsin(d*x + c)^2/d - 2/9*(-(d*x + c)^2 + 1)^(3/2)*b^
2*e^2*arcsin(d*x + c)/d - 2/27*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^2/d + 2/3*
(d*x + c)*a*b*e^2*arcsin(d*x + c)/d - 2/9*(-(d*x + c)^2 + 1)^(3/2)*a*b*e^2/
d + 2/3*sqrt(-(d*x + c)^2 + 1)*b^2*e^2*arcsin(d*x + c)/d - 14/27*(d*x + c)*
b^2*e^2/d + 2/3*sqrt(-(d*x + c)^2 + 1)*a*b*e^2/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^2, x)
```

3.191 $\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 21, antiderivative size = 105

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = -\frac{b^2e(c+dx)^2}{4d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d} - \frac{e(a+b\arcsin(c+dx))^2}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}$$

```
[Out] -1/4*b^2*e*(d*x+c)^2/d-1/4*e*(a+b*arcsin(d*x+c))^2/d+1/2*e*(d*x+c)^2*(a+b*a
rcsin(d*x+c))^2/d+1/2*b*e*(d*x+c)*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4889, 12, 4723, 4795, 4737, 30}

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} + \frac{be\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+dx))}{2d} - \frac{e(a+b\arcsin(c+dx))^2}{4d} - \frac{b^2e(c+dx)^2}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -1/4*(b^2*e*(c + d*x)^2)/d + (b*e*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*Ar
cSin[c + d*x]))/(2*d) - (e*(a + b*ArcSin[c + d*x])^2)/(4*d) + (e*(c + d*x)^
2*(a + b*ArcSin[c + d*x])^2)/(2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} - \frac{(be)\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}\\
&= \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d}\\
&\quad + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} - \frac{(be)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\\
&\quad - \frac{(b^2e)\,\text{Subst}\left(\int x\,dx,x,c+dx\right)}{2d}\\
&= -\frac{b^2e(c+dx)^2}{4d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d}\\
&\quad - \frac{e(a+b\arcsin(c+dx))^2}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.82

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx =$$

$$-\frac{e\left(b^2(c+dx)^2-2b(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))+(a+b\arcsin(c+dx))^2-2(c+dx)\right.}{4d}$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -1/4*(e*(b^2*(c + d*x)^2 - 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSi
n[c + d*x]) + (a + b*ArcSin[c + d*x])^2 - 2*(c + d*x)^2*(a + b*ArcSin[c + d
*x])^2))/d
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.39

method	result
derivativedivides	$\frac{\frac{a^2e(dx+c)^2}{2}+b^2e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c)^2}{4}-\frac{(dx+c)^2}{4}\right)-}{d}$
default	$\frac{\frac{a^2e(dx+c)^2}{2}+b^2e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c)^2}{4}-\frac{(dx+c)^2}{4}\right)-}{d}$
parts	$a^2e\left(\frac{1}{2}d\,x^2+cx\right)+\frac{b^2e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c)^2}{4}\right.}{d}$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/2*a^2*e*(d*x+c)^2+b^2*e*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^2+1/2*arcsi
n(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-1/4*arcsin(d*x+c)^2-1/
4*(d*x+c)^2)+2*e*a*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*x+c)^2)
^(1/2)-1/4*arcsin(d*x+c)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.79

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \frac{(2\,a^2-b^2)d^2ex^2+2\,(2\,a^2-b^2)cdex+(2\,b^2d^2ex^2+4\,b^2cdex+(2\,b^2c^2-b^2)e)\arcsin\left(dx+c\right)^2+2\,(2\,abd^2ex}{}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/4*((2*a^2 - b^2)*d^2*e*x^2 + 2*(2*a^2 - b^2)*c*d*e*x + (2*b^2*d^2*e*x^2 +
 4*b^2*c*d*e*x + (2*b^2*c^2 - b^2)*e)*arcsin(d*x + c)^2 + 2*(2*a*b*d^2*e*x^
2 + 4*a*b*c*d*e*x + (2*a*b*c^2 - a*b)*e)*arcsin(d*x + c) + 2*(a*b*d*e*x + a
*b*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c
^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 335 vs. 2(88) = 176.

Time = 0.21 (sec) , antiderivative size = 335, normalized size of antiderivative = 3.19

$$\int (ce + dex)(a + b\arcsin(c + dx))^2\,dx$$
$$= \begin{cases} a^2cex + \frac{a^2dex^2}{2} + \frac{abc^2e\operatorname{asin}(c+dx)}{d} + 2abcex\operatorname{asin}(c+dx) + \frac{abce\sqrt{-c^2-2cdx-d^2x^2+1}}{2d} + abdex^2\operatorname{asin}(c+dx) + \frac{a \\ cex(a + b\operatorname{asin}(c))^2 \end{cases}$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*c*e*x + a**2*d*e*x**2/2 + a*b*c**2*e*asin(c + d*x)/d + 2*a*
b*c*e*x*asin(c + d*x) + a*b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(2*d)
 + a*b*d*e*x**2*asin(c + d*x) + a*b*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
1)/2 - a*b*e*asin(c + d*x)/(2*d) + b**2*c**2*e*asin(c + d*x)**2/(2*d) + b**
2*c*e*x*asin(c + d*x)**2 - b**2*c*e*x/2 + b**2*c*e*sqrt(-c**2 - 2*c*d*x - d
**2*x**2 + 1)*asin(c + d*x)/(2*d) + b**2*d*e*x**2*asin(c + d*x)**2/2 - b**2
*d*e*x**2/4 + b**2*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/
2 - b**2*e*asin(c + d*x)**2/(4*d), Ne(d, 0)), (c*e*x*(a + b*asin(c))**2, Tr
ue))
```

Maxima [F]

$$\int (ce + dex)(a + b\arcsin(c + dx))^2\,dx = \int (dex + ce)(b\arcsin(dx + c) + a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*d*e*x^2 + 1/2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*
d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3
- 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*d*e + a^2*c*e*x + 2*((d*
x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a*b*c*e/d + 1/2*(b^2*d*e*x
^2 + 2*b^2*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2
+ integrate((b^2*d^2*e*x^2 + 2*b^2*c*d*e*x)*sqrt(d*x + c + 1)*sqrt(-d*x - c
 + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d^2*x^2 + 2*c
*d*x + c^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.75

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \frac{\left((dx+c)^2-1\right)b^2e\arcsin\left(dx+c\right)^2}{2\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)b^2e\arcsin\left(dx+c\right)}{2\,d} + \frac{\left((dx+c)^2-1\right)abe\arcsin\left(dx+c\right)}{d} + \frac{b^2e\arcsin\left(dx+c\right)^2}{4\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)abe}{2\,d} + \frac{\left((dx+c)^2-1\right)a^2e}{2\,d} - \frac{\left((dx+c)^2-1\right)b^2e}{4\,d} + \frac{abe\arcsin\left(dx+c\right)}{2\,d} - \frac{b^2e}{8\,d}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*((d*x + c)^2 - 1)*b^2*e*arcsin(d*x + c)^2/d + 1/2*sqrt(-(d*x + c)^2 + 1
)*(d*x + c)*b^2*e*arcsin(d*x + c)/d + ((d*x + c)^2 - 1)*a*b*e*arcsin(d*x +
c)/d + 1/4*b^2*e*arcsin(d*x + c)^2/d + 1/2*sqrt(-(d*x + c)^2 + 1)*(d*x + c)
*a*b*e/d + 1/2*((d*x + c)^2 - 1)*a^2*e/d - 1/4*((d*x + c)^2 - 1)*b^2*e/d +
1/2*a*b*e*arcsin(d*x + c)/d - 1/8*b^2*e/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \int (c\,e+d\,e\,x)\ \left(a+b\,\mathrm{asin}(c+d\,x)\right)^2\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^2,x)
```

```
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^2, x)
```

3.192 $\int (a+b \arcsin(c+dx))^2 \, dx$

Optimal result

Integrand size = 12, antiderivative size = 59

$$\int (a+b \arcsin(c+dx))^2 \, dx = -2b^2x + \frac{2b\sqrt{1-(c+dx)^2}(a+b \arcsin(c+dx))}{d} + \frac{(c+dx)(a+b \arcsin(c+dx))^2}{d}$$

```
[Out] -2*b^2*x+(d*x+c)*(a+b*arcsin(d*x+c))^2/d+2*b*(a+b*arcsin(d*x+c))*(1-(d*x+c)
^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4887, 4715, 4767, 8}

$$\int (a+b \arcsin(c+dx))^2 \, dx = \frac{2b\sqrt{1-(c+dx)^2}(a+b \arcsin(c+dx))}{d} + \frac{(c+dx)(a+b \arcsin(c+dx))^2}{d} - 2b^2x$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/d + ((c + d*
x)*(a + b*ArcSin[c + d*x])^2)/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^2\,dx, x, c+dx\right)}{d} \\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^2}{d} - \frac{(2b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d} \\
&= \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d} \\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^2}{d} - \frac{(2b^2)\,\text{Subst}\left(\int 1\,dx, x, c+dx\right)}{d} \\
&= -2b^2x + \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^2}{d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.03

$$\int (a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{-2b^2(c+dx)+2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))+(c+dx)(a+b\arcsin(c+dx))^2}{d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2,x]
[Out] (-2*b^2*(c + d*x) + 2*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (c
+ d*x)*(a + b*ArcSin[c + d*x])^2)/d
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.53

method	result
parts	$a^2x+\frac{b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)}{d}+\frac{2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$
derivativedivides	$\frac{(dx+c)a^2+b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)+2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$
default	$\frac{(dx+c)a^2+b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)+2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$

```
[In] int((a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*x+b^2/d*(arcsin(d*x+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^2
)^(1/2))+2*a*b/d*((d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.59

$$\int(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{(a^2-2\,b^2)dx+(b^2dx+b^2c)\arcsin\left(dx+c\right)^2+2\left(abdx+abc\right)\arcsin\left(dx+c\right)+2\sqrt{-d^2x^2-2\,cdx-c^2+}}{d}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] ((a^2 - 2*b^2)*d*x + (b^2*d*x + b^2*c)*arcsin(d*x + c)^2 + 2*(a*b*d*x + a*b
*c)*arcsin(d*x + c) + 2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(b^2*arcsin(d*x
+ c) + a*b))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 143 vs. $2(51) = 102$.

Time = 0.12 (sec) , antiderivative size = 143, normalized size of antiderivative = 2.42

$$\int(a+b\arcsin(c+dx))^2\,dx$$
$$=\begin{cases}a^2x+\frac{2abc\operatorname{asin}\left(c+dx\right)}{d}+2abx\operatorname{asin}\left(c+dx\right)+\frac{2ab\sqrt{-c^2-2cdx-d^2x^2+1}}{d}+\frac{b^2c\operatorname{asin}^2\left(c+dx\right)}{d}+b^2x\operatorname{asin}^2\left(c+dx\right)-2b^2\\x(a+b\operatorname{asin}\left(c\right))^2\end{cases}$$

```
[In] integrate((a+b*asin(d*x+c))**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*c*asin(c + d*x)/d + 2*a*b*x*asin(c + d*x) + 2*a*b
*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + b**2*c*asin(c + d*x)**2/d + b**2
*x*asin(c + d*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
1)*asin(c + d*x)/d, Ne(d, 0)), (x*(a + b*asin(c))**2, True))
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin\left(dx+c\right)+a)^2\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] (x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*d*integrate
(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*x*arctan2(d*x + c, sqrt(d*x + c + 1)*
sqrt(-d*x - c + 1))/(d^2*x^2 + 2*c*d*x + c^2 - 1), x))*b^2 + a^2*x + 2*((d*
x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a*b/d
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.88

$$\begin{aligned}\int (a+b\arcsin(c+dx))^2\,dx=&\frac{(dx+c)b^2\arcsin\left(dx+c\right)^2}{d}+\frac{2\,(dx+c)ab\arcsin\left(dx+c\right)}{d}\\&+\frac{2\,\sqrt{-(dx+c)^2+1}b^2\arcsin\left(dx+c\right)}{d}+\frac{(dx+c)a^2}{d}\\&-\frac{2\,(dx+c)b^2}{d}+\frac{2\,\sqrt{-(dx+c)^2+1}ab}{d}\end{aligned}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] (d*x + c)*b^2*arcsin(d*x + c)^2/d + 2*(d*x + c)*a*b*arcsin(d*x + c)/d + 2*s
qrt(-(d*x + c)^2 + 1)*b^2*arcsin(d*x + c)/d + (d*x + c)*a^2/d - 2*(d*x + c)
*b^2/d + 2*sqrt(-(d*x + c)^2 + 1)*a*b/d
```

Mupad [B] (verification not implemented)

Time = 0.52 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.49

$$\int (a+b\arcsin(c+dx))^2\,dx = a^2\,x+\frac{b^2\,\left(\mathrm{asin}(c+d\,x)^2-2\right)\,(c+d\,x)}{d}+\frac{2\,a\,b\left(\sqrt{1-(c+d\,x)^2}+\mathrm{asin}(c+d\,x)\,(c+d\,x)\right)}{d}+\frac{2\,b^2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-(c+d\,x)^2}}{d}$$

```
[In] int((a + b*asin(c + d*x))^2,x)
```

```
[Out] a^2*x + (b^2*(asin(c + d*x)^2 - 2)*(c + d*x))/d + (2*a*b*((1 - (c + d*x)^2)
^(1/2) + asin(c + d*x)*(c + d*x)))/d + (2*b^2*asin(c + d*x)*(1 - (c + d*x)^
2)^(1/2))/d
```

3.193 $\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 126

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=-\frac{i(a+b\arcsin(c+dx))^3}{3bde}+\frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}-\frac{ib(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de}+\frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[Out] -1/3*I*(a+b*arcsin(d*x+c))^3/b/d/e+(a+b*arcsin(d*x+c))^2*ln(1-(I*(d*x+c)+(1
-(d*x+c)^2)^(1/2))^2)/d/e-I*b*(a+b*arcsin(d*x+c))*polylog(2,(I*(d*x+c)+(1-(
d*x+c)^2)^(1/2))^2)/d/e+1/2*b^2*polylog(3,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2
)/d/e
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4889, 12, 4721, 3798, 2221, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=-\frac{ib\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de}-\frac{i(a+b\arcsin(c+dx))^3}{3bde}+\frac{\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de}+\frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x),x]
```

```
[Out] ((-1/3*I)*(a + b*ArcSin[c + d*x])^3)/(b*d*e) + ((a + b*ArcSin[c + d*x])^2*L
og[1 - E^((2*I)*ArcSin[c + d*x])])/(d*e) - (I*b*(a + b*ArcSin[c + d*x])*Pol
yLog[2, E^((2*I)*ArcSin[c + d*x])])/(d*e) + (b^2*PolyLog[3, E^((2*I)*ArcSin
[c + d*x])])/(2*d*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{ex}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x}\,dx, x, c+dx\right)}{de}\\
&= \frac{\text{Subst}\left(\int (a+bx)^2\cot(x)\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^3}{3bde} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^3}{3bde} + \frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^3}{3bde} + \frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad - \frac{ib(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad + \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}\\
&= -\frac{i(a+b\arcsin(c+dx))^3}{3bde} + \frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad - \frac{ib(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{de}\\
&\quad + \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{2i\arcsin(c+dx)}\right)}{2de}
\end{aligned}
$$

$$= -\frac{i(a+b\arcsin(c+dx))^3}{3bde} + \frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{ib(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de}$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.35

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \frac{2ab\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right)+a^2\log(c+dx)-iab\left(\arcsin(c+dx)^2+\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+}\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x),x]
```

```
[Out] (2*a*b*ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] + a^2*Log[c + d*x
] - I*a*b*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])]) + b^2
*((-1/24*I)*Pi^3 + (I/3)*ArcSin[c + d*x]^3 + ArcSin[c + d*x]^2*Log[1 - E^((
-2*I)*ArcSin[c + d*x])] + I*ArcSin[c + d*x]*PolyLog[2, E^((-2*I)*ArcSin[c +
 d*x])] + PolyLog[3, E^((-2*I)*ArcSin[c + d*x])]/2))/(d*e)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 366 vs. 2(156) = 312.

Time = 0.65 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.91

method	result
derivativedivides	$\frac{\frac{a^2\ln(dx+c)}{e}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx-}\right.\right.}{}}{}$
default	$\frac{\frac{a^2\ln(dx+c)}{e}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx-}\right.\right.}{}}{}$
parts	$\frac{a^2\ln(dx+c)}{ed}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(d\right.\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^2/e*ln(d*x+c)+b^2/e*(-1/3*I*arcsin(d*x+c)^3+arcsin(d*x+c)^2*ln(1+I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*x+
```

```
c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^2*ln
(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,I*(d*x+c)+(1-
(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+2*a*b/e*(-1/2
*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-I*poly
log(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+
c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^2}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d*e*x + c*e
), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=\frac{\int \frac{a^2}{c+dx}\,dx+\int \frac{b^2\operatorname{asin}^2(c+dx)}{c+dx}\,dx+\int \frac{2ab\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e),x)
```

```
[Out] (Integral(a**2/(c + d*x), x) + Integral(b**2*asin(c + d*x)**2/(c + d*x), x)
 + Integral(2*a*b*asin(c + d*x)/(c + d*x), x))/e
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^2}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="maxima")
```

```
[Out] a^2*log(d*e*x + c*e)/(d*e) + integrate((b^2*arctan2(d*x + c, sqrt(d*x + c +
 1)*sqrt(-d*x - c + 1))^2 + 2*a*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-
d*x - c + 1)))/(d*e*x + c*e), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x), x)
```

3.194 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 116

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} - \frac{4b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{2ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{2ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2}$$

```
[Out] -(a+b*arcsin(d*x+c))^2/d/e^2/(d*x+c)-4*b*(a+b*arcsin(d*x+c))*arctanh(I*(d*x
+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+2*I*b^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(
1/2))/d/e^2-2*I*b^2*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4889, 12, 4723, 4803, 4268, 2317, 2438}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = -\frac{4b\,\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^2} - \frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} + \frac{2ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{2ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c + d*x])^2/(d*e^2*(c + d*x))) - (4*b*(a + b*ArcSin[c + d*x
])*ArcTanh[E^(I*ArcSin[c + d*x])])/(d*e^2) + ((2*I)*b^2*PolyLog[2, -E^(I*Ar
cSin[c + d*x])])/(d*e^2) - ((2*I)*b^2*PolyLog[2, E^(I*ArcSin[c + d*x])])/(d
*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{e^2x^2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^2}\,dx, x, c+dx\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} + \frac{(2b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} + \frac{(2b)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} - \frac{4b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(2b^2)\,\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} + \frac{(2b^2)\,\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} - \frac{4b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{(2ib^2)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(2ib^2)\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} - \frac{4b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{2ib^2\,\text{PolyLog}\left(2, -e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{2ib^2\,\text{PolyLog}\left(2, e^{i\arcsin(c+dx)}\right)}{de^2}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.52

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx$$
$$= \frac{-\frac{a^2}{c+dx} - 2ab\left(\frac{\arcsin(c+dx)}{c+dx} + \log\left(\frac{1}{2}(c+dx)\csc\left(\frac{1}{2}\arcsin(c+dx)\right)\right) - \log\left(\sin\left(\frac{1}{2}\arcsin(c+dx)\right)\right)\right) + b^2\left(\text{arcs}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^2,x]
```

```
[Out] (-(a^2/(c + d*x)) - 2*a*b*(ArcSin[c + d*x]/(c + d*x) + Log[((c + d*x)*Csc[A
rcSin[c + d*x]/2])/2] - Log[Sin[ArcSin[c + d*x]/2]]) + b^2*(ArcSin[c + d*x]
*(-(ArcSin[c + d*x]/(c + d*x)) + 2*Log[1 - E^(I*ArcSin[c + d*x])] - 2*Log[1
 + E^(I*ArcSin[c + d*x])]) + (2*I)*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (2*
I)*PolyLog[2, E^(I*ArcSin[c + d*x])]))/(d*e^2)
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.78

method	result
derivativedivides	$\frac{-\frac{a^2}{e^2(dx+c)}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+2\cdots\right)}{e^2}}{d}$
default	$\frac{-\frac{a^2}{e^2(dx+c)}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+2\cdots\right)}{e^2}}{d}$
parts	$-\frac{a^2}{e^2(dx+c)d}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\cdots\right)\right)}{e^2d}$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a^2/e^2/(d*x+c)+b^2/e^2*(-arcsin(d*x+c)^2/(d*x+c)+2*arcsin(d*x+c)*ln(
1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^
2)^(1/2))+2*I*dilog(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*dilog(1-I*(d*x+c)-
(1-(d*x+c)^2)^(1/2)))+2*a*b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-(d*x
+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d^2*e^2*x^2
 + 2*c*d*e^2*x + c^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \frac{\int \frac{a^2}{c^2+2cdx+d^2x^2}\,dx + \int \frac{b^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{2ab\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**2,x)
```

```
[Out] (Integral(a**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**2*asin(c + d*
x)**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(2*a*b*asin(c + d*x)/(c**2
 + 2*c*d*x + d**2*x**2), x))/e**2
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \int \frac{(a+b\operatorname{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^2,x)
```

```
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^2, x)
```

3.195 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 87

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b^2\log(c+dx)}{de^3}$$

```
[Out] -1/2*(a+b*arcsin(d*x+c))^2/d/e^3/(d*x+c)^2+b^2*ln(d*x+c)/d/e^3-b*(a+b*arcsi
n(d*x+c))*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4889, 12, 4723, 4771, 29}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b^2\log(c+dx)}{de^3}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^3,x]
```

```
[Out] -((b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(d*e^3*(c + d*x))) - (a
 + b*ArcSin[c + d*x])^2/(2*d*e^3*(c + d*x)^2) + (b^2*Log[c + d*x])/(d*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{e^3x^3}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^3}\,dx, x, c+dx\right)}{de^3}\\
&= -\frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^2\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^3}\\
&= -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{de^3(c+dx)}\\
&\quad -\frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b^2\text{Subst}\left(\int \frac{1}{x}\,dx, x, c+dx\right)}{de^3}\\
&= -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b^2\log(c+dx)}{de^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.45

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{a\left(a+2b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}\right)+2b\left(a+b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}\right)\arcsin(c+dx)+}{2de^3(c+dx)^2}$$

[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^3,x]

[Out] -1/2*(a*(a + 2*b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]) + 2*b*(a + b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + b^2*ArcSin[c + d*x]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x])/(d*e^3*(c + d*x)^2)

Maple [A] (verified)

Time = 0.66 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.44

method	result
derivativedivides	$\frac{-\frac{a^2}{2e^3(dx+c)^2}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$
default	$\frac{-\frac{a^2}{2e^3(dx+c)^2}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$
parts	$-\frac{a^2}{2e^3(dx+c)^2d}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3d}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3d}$

[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(-1/2*a^2/e^3/(d*x+c)^2+b^2/e^3*(-1/2*arcsin(d*x+c)^2/(d*x+c)^2-arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+2*a*b/e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.68

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b^2\arcsin(dx+c)^2+2\,ab\arcsin(dx+c)+a^2-2\,(b^2d^2x^2+2\,b^2cdx+b^2c^2)\log(dx+c)+2\,(abdx+abc}{2\,(d^3e^3x^2+2\,cd^2e^3x+c^2de^3)}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="fricas")
[Out] -1/2*(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2 - 2*(b^2*d^2*x^2
+ 2*b^2*c*d*x + b^2*c^2)*log(d*x + c) + 2*(a*b*d*x + a*b*c + (b^2*d*x + b^2
*c)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(d^3*e^3*x^2 + 2*c
*d^2*e^3*x + c^2*d*e^3)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = \frac{\int \frac{a^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{b^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2ab\operatorname{asin}(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**3,x)
[Out] (Integral(a**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(b**2*asin(c + d*x)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x
) + Integral(2*a*b*asin(c + d*x)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*
x**3), x))/e**3
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 236 vs. 2(83) = 166.

Time = 0.28 (sec) , antiderivative size = 236, normalized size of antiderivative = 2.71

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx &= -\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}\,d\arcsin(dx+c)}{d^3e^3x+cd^2e^3}-\frac{\log(dx+c)}{de^3}\right)b^2 \\ &\quad -ab\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}\,d}{d^3e^3x+cd^2e^3}+\frac{\arcsin(dx+c)}{d^3e^3x^2+2\,cd^2e^3x+c^2de^3}\right) \\ &\quad -\frac{b^2\arcsin(dx+c)^2}{2\,(d^3e^3x^2+2\,cd^2e^3x+c^2de^3)}-\frac{a^2}{2\,(d^3e^3x^2+2\,cd^2e^3x+c^2de^3)}\end{aligned}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="maxima")
```

```
[Out] -(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*d*arcsin(d*x + c)/(d^3*e^3*x + c*d^2*e
^3) - log(d*x + c)/(d*e^3))*b^2 - a*b*(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*d
/(d^3*e^3*x + c*d^2*e^3) + arcsin(d*x + c)/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c
^2*d*e^3)) - 1/2*b^2*arcsin(d*x + c)^2/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c^2*d
*e^3) - 1/2*a^2/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c^2*d*e^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 510 vs. $2(83) = 166$.

Time = 0.37 (sec) , antiderivative size = 510, normalized size of antiderivative = 5.86

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b^2\arcsin\left(dx+c\right)^2}{4\,de^3} - \frac{(dx+c)^2b^2\arcsin\left(dx+c\right)^2}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{b^2\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin\left(dx+c\right)^2}{8\,(dx+c)^2de^3} - \frac{ab\arcsin\left(dx+c\right)}{2\,de^3} - \frac{(dx+c)^2ab\arcsin\left(dx+c\right)}{4\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)b^2\arcsin\left(dx+c\right)}{2\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b^2\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin\left(dx+c\right)}{2\,(dx+c)de^3} - \frac{ab\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin\left(dx+c\right)}{4\,(dx+c)^2de^3} + \frac{2\,b^2\log\left(2\right)}{de^3} - \frac{b^2\log\left(2\sqrt{-(dx+c)^2+1}+2\right)}{de^3} + \frac{b^2\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{de^3} + \frac{b^2\log\left(|dx+c|\right)}{de^3} - \frac{a^2}{4\,de^3} - \frac{(dx+c)^2a^2}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)ab}{2\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{ab\left(\sqrt{-(dx+c)^2+1}+1\right)}{2\,(dx+c)de^3} - \frac{a^2\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{8\,(dx+c)^2de^3}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="giac")
```

```
[Out] -1/4*b^2*arcsin(d*x + c)^2/(d*e^3) - 1/8*(d*x + c)^2*b^2*arcsin(d*x + c)^2/
(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*b^2*(sqrt(-(d*x + c)^2 + 1) +
1)^2*arcsin(d*x + c)^2/((d*x + c)^2*d*e^3) - 1/2*a*b*arcsin(d*x + c)/(d*e^3
) - 1/4*(d*x + c)^2*a*b*arcsin(d*x + c)/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)
^2) + 1/2*(d*x + c)*b^2*arcsin(d*x + c)/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)
) - 1/2*b^2*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d*e^3)
- 1/4*a*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2*arcsin(d*x + c)/((d*x + c)^2*d*e^3
) + 2*b^2*log(2)/(d*e^3) - b^2*log(2*sqrt(-(d*x + c)^2 + 1) + 2)/(d*e^3) +
b^2*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^3) + b^2*log(abs(d*x + c))/(d*e^3)
 - 1/4*a^2/(d*e^3) - 1/8*(d*x + c)^2*a^2/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1
)^2) + 1/2*(d*x + c)*a*b/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)) - 1/2*a*b*(sq
rt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^3) - 1/8*a^2*(sqrt(-(d*x + c)^2 +
1) + 1)^2/((d*x + c)^2*d*e^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^2}{{\left(c\,e+d\,e\,x\right)}^3}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^3,x)
```

```
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^3, x)
```

3.196 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4} dx$

Optimal result

Integrand size = 23, antiderivative size = 187

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4} dx = -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} - \frac{2b(a+b\arcsin(c+dx))\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{ib^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{ib^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{3de^4}$$

```
[Out] -1/3*b^2/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^2/d/e^4/(d*x+c)^3-2/3*b*(a+b
*arcsin(d*x+c))*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4+1/3*I*b^2*poly
log(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-1/3*I*b^2*polylog(2,I*(d*x+c)+(
1-(d*x+c)^2)^(1/2))/d/e^4-1/3*b*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d/e
^4/(d*x+c)^2
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4889, 12, 4723, 4789, 4803, 4268, 2317, 2438, 30}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = -\frac{2b\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{3de^4} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} + \frac{ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{b^2}{3de^4(c+dx)}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^4,x]
```

```
[Out] -1/3*b^2/(d*e^4*(c + d*x)) - (b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x
]))/(3*d*e^4*(c + d*x)^2) - (a + b*ArcSin[c + d*x])^2/(3*d*e^4*(c + d*x)^3)
 - (2*b*(a + b*ArcSin[c + d*x])*ArcTanh[E^(I*ArcSin[c + d*x])])/(3*d*e^4) +
 ((I/3)*b^2*PolyLog[2, -E^(I*ArcSin[c + d*x])])/(d*e^4) - ((I/3)*b^2*PolyLo
g[2, E^(I*ArcSin[c + d*x])])/(d*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{e^4x^4}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^4}\,dx, x, c+dx\right)}{de^4}$$

$$= -\frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} + \frac{(2b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^3\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^4}$$

$$= -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^4} + \frac{b^2\text{Subst}\left(\int \frac{1}{x^2}\,dx, x, c+dx\right)}{3de^4}$$

$$= -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(c+dx)\right)}{3de^4}$$

$$= -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} - \frac{2b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{b^2\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{3de^4} + \frac{b^2\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{3de^4}$$

$$= -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} - \frac{2b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{(ib^2)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{(ib^2)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{3de^4}$$

$$= -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} - \frac{2b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{ib^2\,\text{PolyLog}\left(2, -e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{ib^2\,\text{PolyLog}\left(2, e^{i\arcsin(c+dx)}\right)}{3de^4}$$

Mathematica [A] (verified)

Time = 2.53 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.32

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx =$$
$$-\frac{4a^2+8ab\arcsin(c+dx)-4ib^2(c+dx)^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)+2ab\sin(2\arcsin(c+dx))+ab\big(\log$$

[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^4,x]

[Out] -1/12*(4*a^2 + 8*a*b*ArcSin[c + d*x] - (4*I)*b^2*(c + d*x)^3*PolyLog[2, -E^(I*ArcSin[c + d*x])] + 2*a*b*Sin[2*ArcSin[c + d*x]] + a*b*(Log[Cos[ArcSin[c + d*x]/2]] - Log[Sin[ArcSin[c + d*x]/2]])*(3*(c + d*x) - Sin[3*ArcSin[c + d*x]]) + b^2*(4*(c + d*x)^2 + 4*ArcSin[c + d*x]^2 + (4*I)*(c + d*x)^3*PolyLog[2, E^(I*ArcSin[c + d*x])] + ArcSin[c + d*x]*(2*Sin[2*ArcSin[c + d*x]] + (Log[1 - E^(I*ArcSin[c + d*x])] - Log[1 + E^(I*ArcSin[c + d*x])])*(-3*(c + d*x) + Sin[3*ArcSin[c + d*x]]))))/(d*e^4*(c + d*x)^3)

Maple [A] (verified)

Time = 0.99 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.40

method	result
derivativedivides	$\frac{-\frac{a^2}{3e^4(dx+c)^3}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)}{3}+\frac{i\,\mathrm{po}}{}\right.}{}}{}$
default	$\frac{-\frac{a^2}{3e^4(dx+c)^3}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)}{3}+\frac{i\,\mathrm{po}}{}\right.}{}}{}$
parts	$-\frac{a^2}{3e^4(dx+c)^3d}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right.}{3}\right.}{}$

[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)

[Out] 1/d*(-1/3*a^2/e^4/(d*x+c)^3+b^2/e^4*(-1/3*(arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+(d*x+c)^2)/(d*x+c)^3-1/3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+1/3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+1/3*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3*I*polylog(2,I*(d*x

```
+c)+(1-(d*x+c)^2)^(1/2)))+2*a*b/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)-1/6/(d*x+
c)^2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="fricas")
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d^4*e^4*x^4
 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*e^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = \frac{\int \frac{a^2}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b^2\operatorname{asin}^2(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{2ab\operatorname{asin}(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx}{e^4}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**4,x)
[Out] (Integral(a**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4
*x**4), x) + Integral(b**2*asin(c + d*x)**2/(c**4 + 4*c**3*d*x + 6*c**2*d**
2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(2*a*b*asin(c + d*x)/(c**
4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x))/e**4
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="maxima")
[Out] -1/3*a^2/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1/
3*(b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 3*(d^4*e^
4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(2/3*((b^2*
d*x + b^2*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x
 + c + 1)*sqrt(-d*x - c + 1)) - 3*(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*
b)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/(d^6*e^4*x^6 + 6
*c*d^5*e^4*x^5 + (15*c^2 - 1)*d^4*e^4*x^4 + 4*(5*c^3 - c)*d^3*e^4*x^3 + 3*(
5*c^4 - 2*c^2)*d^2*e^4*x^2 + 2*(3*c^5 - 2*c^3)*d*e^4*x + (c^6 - c^4)*e^4),
x))/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^4}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^4,x)
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^4, x)
```

3.197 $\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 338

$$\begin{aligned}
&\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx \\
&= -\frac{16}{25}ab^2e^4x - \frac{298b^3e^4\sqrt{1-(c+dx)^2}}{375d} + \frac{76b^3e^4(1-(c+dx)^2)^{3/2}}{1125d} \\
&\quad - \frac{6b^3e^4(1-(c+dx)^2)^{5/2}}{625d} - \frac{16b^3e^4(c+dx)\arcsin(c+dx)}{25d} \\
&\quad - \frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} \\
&\quad + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\
&\quad + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\
&\quad + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\
&\quad + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d}
\end{aligned}$$

```
[Out] -16/25*a*b^2*e^4*x+76/1125*b^3*e^4*(1-(d*x+c)^2)^(3/2)/d-6/625*b^3*e^4*(1-(
d*x+c)^2)^(5/2)/d-16/25*b^3*e^4*(d*x+c)*arcsin(d*x+c)/d-8/75*b^2*e^4*(d*x+c
)^3*(a+b*arcsin(d*x+c))/d-6/125*b^2*e^4*(d*x+c)^5*(a+b*arcsin(d*x+c))/d+1/5
*e^4*(d*x+c)^5*(a+b*arcsin(d*x+c))^3/d-298/375*b^3*e^4*(1-(d*x+c)^2)^(1/2)/
d+8/25*b*e^4*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+4/25*b*e^4*(d*x+c)
^2*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+3/25*b*e^4*(d*x+c)^4*(a+b*ar
csin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4889, 12, 4723, 4795, 4767, 4715, 267, 272, 45}

$$\begin{aligned}
&\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx \\
&= -\frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} \\
&\quad -\frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d}+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d} \\
&\quad +\frac{3be^4\sqrt{1-(c+dx)^2}(c+dx)^4(a+b\arcsin(c+dx))^2}{25d} \\
&\quad +\frac{4be^4\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\arcsin(c+dx))^2}{25d} \\
&\quad +\frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d}-\frac{16}{25}ab^2e^4x \\
&\quad -\frac{16b^3e^4(c+dx)\arcsin(c+dx)}{25d}-\frac{6b^3e^4\left(1-(c+dx)^2\right)^{5/2}}{625d} \\
&\quad +\frac{76b^3e^4\left(1-(c+dx)^2\right)^{3/2}}{1125d}-\frac{298b^3e^4\sqrt{1-(c+dx)^2}}{375d}
\end{aligned}$$

```
[In] Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (-16*a*b^2*e^4*x)/25 - (298*b^3*e^4*Sqrt[1 - (c + d*x)^2])/(375*d) + (76*b^
3*e^4*(1 - (c + d*x)^2)^(3/2))/(1125*d) - (6*b^3*e^4*(1 - (c + d*x)^2)^(5/2
))/(625*d) - (16*b^3*e^4*(c + d*x)*ArcSin[c + d*x])/(25*d) - (8*b^2*e^4*(c
+ d*x)^3*(a + b*ArcSin[c + d*x]))/(75*d) - (6*b^2*e^4*(c + d*x)^5*(a + b*Ar
cSin[c + d*x]))/(125*d) + (8*b*e^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c +
d*x])^2)/(25*d) + (4*b*e^4*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[
c + d*x])^2)/(25*d) + (3*b*e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*Arc
Sin[c + d*x])^2)/(25*d) + (e^4*(c + d*x)^5*(a + b*ArcSin[c + d*x])^3)/(5*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^4x^4(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int x^4(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d} - \frac{(3be^4)\,\text{Subst}\left(\int \frac{x^5(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{5d}\\
&= \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d}\\
&\quad+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d}\\
&\quad-\frac{(12be^4)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{25d}\\
&\quad-\frac{(6b^2e^4)\,\text{Subst}\left(\int x^4(a+b\arcsin(x))\,dx,x,c+dx\right)}{25d}\\
&= -\frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d}\\
&\quad+\frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d}\\
&\quad+\frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d}\\
&\quad+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d}-\frac{(8be^4)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{25d}\\
&\quad-\frac{(8b^2e^4)\,\text{Subst}\left(\int x^2(a+b\arcsin(x))\,dx,x,c+dx\right)}{25d}\\
&\quad+\frac{(6b^3e^4)\,\text{Subst}\left(\int \frac{x^5}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{125d}
\end{aligned}$$

$$= -\frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d} - \frac{(16b^2e^4)\operatorname{Subst}(\int(a+b\arcsin(x))\,dx,x,c+dx)}{25d} + \frac{(3b^3e^4)\operatorname{Subst}\left(\int\frac{x^2}{\sqrt{1-x}}\,dx,x,(c+dx)^2\right)}{125d} + \frac{(8b^3e^4)\operatorname{Subst}\left(\int\frac{x^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{75d}$$

$$= -\frac{16}{25}ab^2e^4x - \frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d} + \frac{(3b^3e^4)\operatorname{Subst}\left(\int\left(\frac{1}{\sqrt{1-x}}-2\sqrt{1-x}+(1-x)^{3/2}\right)\,dx,x,(c+dx)^2\right)}{125d} + \frac{(4b^3e^4)\operatorname{Subst}\left(\int\frac{x}{\sqrt{1-x}}\,dx,x,(c+dx)^2\right)}{75d} - \frac{(16b^3e^4)\operatorname{Subst}(\int\arcsin(x)\,dx,x,c+dx)}{25d}$$

$$= -\frac{16}{25}ab^2e^4x - \frac{6b^3e^4\sqrt{1-(c+dx)^2}}{125d} + \frac{4b^3e^4(1-(c+dx)^2)^{3/2}}{125d} - \frac{6b^3e^4(1-(c+dx)^2)^{5/2}}{625d} - \frac{16b^3e^4(c+dx)\arcsin(c+dx)}{25d} - \frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d} + \frac{(4b^3e^4)\,\text{Subst}\left(\int\left(\frac{1}{\sqrt{1-x}}-\sqrt{1-x}\right)dx, x, (c+dx)^2\right)}{75d} + \frac{(16b^3e^4)\,\text{Subst}\left(\int\frac{x}{\sqrt{1-x^2}}dx, x, c+dx\right)}{25d}$$

$$= -\frac{16}{25}ab^2e^4x - \frac{298b^3e^4\sqrt{1-(c+dx)^2}}{375d} + \frac{76b^3e^4(1-(c+dx)^2)^{3/2}}{1125d} - \frac{6b^3e^4(1-(c+dx)^2)^{5/2}}{625d} - \frac{16b^3e^4(c+dx)\arcsin(c+dx)}{25d} - \frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d}$$

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.91

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{e^4\Big((c+dx)^5(a+b\arcsin(c+dx))^3-\frac{1}{25}b\Big(\frac{40}{9}b^2(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2}-\frac{2}{5}b^2\sqrt{1-(c+d}{}$$

[In] Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^3,x]

[Out] (e^4*((c + d*x)^5*(a + b*ArcSin[c + d*x])^3 - (b*((40*b^2*(2 + c^2 + 2*c*d*x + d^2*x^2)*Sqrt[1 - (c + d*x)^2])/9 - (2*b^2*Sqrt[1 - (c + d*x)^2]*(-15 + 10*(1 - (c + d*x)^2) - 3*(-1 + (c + d*x)^2)^2))/5 + (40*b*(c + d*x)^3*(a + b*ArcSin[c + d*x]))/3 + 6*b*(c + d*x)^5*(a + b*ArcSin[c + d*x]) - 40*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - 20*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - 15*(c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 + 80*b*(a*d*x + b*Sqrt[1 - (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))/25))/(5*d)

Maple [A] (verified)

Time = 3.28 (sec) , antiderivative size = 383, normalized size of antiderivative = 1.13

method	result
derivativedivides	$\frac{\frac{e^4a^3(dx+c)^5}{5}+e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}-\frac{2(}{}\right.}{}$
default	$\frac{\frac{e^4a^3(dx+c)^5}{5}+e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}-\frac{2(}{}\right.}{}$
parts	$\frac{e^4a^3(dx+c)^5}{5d}+\frac{e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}\right.}{}$

[In] int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)

[Out] 1/d*(1/5*e^4*a^3*(d*x+c)^5+e^4*b^3*(1/5*(d*x+c)^5*arcsin(d*x+c)^3+1/25*arcsin(d*x+c)^2*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-6/125*(d*x+c)^5*arcsin(d*x+c)-2/625*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-8/75*(d*x+c)^3*arcsin(d*x+c)-8/225*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-16/25*(1-(d*x+c)^2)^(1/2)-16/25*(d*x+c)*arcsin(d*x+c))+3*e^4*a*b^2*(1/5*(d*x+c)^5*arcsin(d*x+c)^2+2/75*arcsin(d*x+c)*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-2/125*(d*x+c)^5-8/225*(d*x+c)^3-16/75*d*x-16/75*c)+3*e^4*a^2*b*(1/5*(d*x+c)^5*arcsin(d*x+c)+1/25*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+8/75*(1-(d*x+c)^2)^(1/2)))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 996 vs. 2(304) = 608.

Time = 0.29 (sec) , antiderivative size = 996, normalized size of antiderivative = 2.95

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx = \frac{45\,(25\,a^3-6\,ab^2)d^5e^4x^5+225\,(25\,a^3-6\,ab^2)cd^4e^4x^4-150\,(4\,ab^2-3\,(25\,a^3-6\,ab^2)c^2)d^3e^4x^3-450\,(4\,ab^2}{}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/5625*(45*(25*a^3 - 6*a*b^2)*d^5*e^4*x^5 + 225*(25*a^3 - 6*a*b^2)*c*d^4*e^
4*x^4 - 150*(4*a*b^2 - 3*(25*a^3 - 6*a*b^2)*c^2)*d^3*e^4*x^3 - 450*(4*a*b^2
*c - (25*a^3 - 6*a*b^2)*c^3)*d^2*e^4*x^2 - 225*(8*a*b^2*c^2 - (25*a^3 - 6*a
*b^2)*c^4 + 16*a*b^2)*d*e^4*x + 1125*(b^3*d^5*e^4*x^5 + 5*b^3*c*d^4*e^4*x^4
 + 10*b^3*c^2*d^3*e^4*x^3 + 10*b^3*c^3*d^2*e^4*x^2 + 5*b^3*c^4*d*e^4*x + b^
3*c^5*e^4)*arcsin(d*x + c)^3 + 3375*(a*b^2*d^5*e^4*x^5 + 5*a*b^2*c*d^4*e^4*
x^4 + 10*a*b^2*c^2*d^3*e^4*x^3 + 10*a*b^2*c^3*d^2*e^4*x^2 + 5*a*b^2*c^4*d*e
^4*x + a*b^2*c^5*e^4)*arcsin(d*x + c)^2 + 15*(9*(25*a^2*b - 2*b^3)*d^5*e^4*
x^5 + 45*(25*a^2*b - 2*b^3)*c*d^4*e^4*x^4 - 10*(4*b^3 - 9*(25*a^2*b - 2*b^3
)*c^2)*d^3*e^4*x^3 - 30*(4*b^3*c - 3*(25*a^2*b - 2*b^3)*c^3)*d^2*e^4*x^2 -
15*(8*b^3*c^2 - 3*(25*a^2*b - 2*b^3)*c^4 + 16*b^3)*d*e^4*x - (40*b^3*c^3 -
9*(25*a^2*b - 2*b^3)*c^5 + 240*b^3*c)*e^4)*arcsin(d*x + c) + (27*(25*a^2*b
- 2*b^3)*d^4*e^4*x^4 + 108*(25*a^2*b - 2*b^3)*c*d^3*e^4*x^3 + 2*(450*a^2*b
- 136*b^3 + 81*(25*a^2*b - 2*b^3)*c^2)*d^2*e^4*x^2 + 4*(27*(25*a^2*b - 2*b^
3)*c^3 + 2*(225*a^2*b - 68*b^3)*c)*d*e^4*x + (27*(25*a^2*b - 2*b^3)*c^4 + 1
800*a^2*b - 4144*b^3 + 4*(225*a^2*b - 68*b^3)*c^2)*e^4 + 225*(3*b^3*d^4*e^4
*x^4 + 12*b^3*c*d^3*e^4*x^3 + 2*(9*b^3*c^2 + 2*b^3)*d^2*e^4*x^2 + 4*(3*b^3*
c^3 + 2*b^3*c)*d*e^4*x + (3*b^3*c^4 + 4*b^3*c^2 + 8*b^3)*e^4)*arcsin(d*x +
c)^2 + 450*(3*a*b^2*d^4*e^4*x^4 + 12*a*b^2*c*d^3*e^4*x^3 + 2*(9*a*b^2*c^2 +
 2*a*b^2)*d^2*e^4*x^2 + 4*(3*a*b^2*c^3 + 2*a*b^2*c)*d*e^4*x + (3*a*b^2*c^4
+ 4*a*b^2*c^2 + 8*a*b^2)*e^4)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^
2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2518 vs. 2(306) = 612.

Time = 1.07 (sec) , antiderivative size = 2518, normalized size of antiderivative = 7.45

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c))**3,x)
```

[Out] Piecewise((a**3*c**4*e**4*x + 2*a**3*c**3*d*e**4*x**2 + 2*a**3*c**2*d**2*e*
*4*x**3 + a**3*c*d**3*e**4*x**4 + a**3*d**4*e**4*x**5/5 + 3*a**2*b*c**5*e**
4*asin(c + d*x)/(5*d) + 3*a**2*b*c**4*e**4*x*asin(c + d*x) + 3*a**2*b*c**4*
e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 6*a**2*b*c**3*d*e**4*x*
*2*asin(c + d*x) + 12*a**2*b*c**3*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
 1)/25 + 6*a**2*b*c**2*d**2*e**4*x**3*asin(c + d*x) + 18*a**2*b*c**2*d*e**4
*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*a**2*b*c**2*e**4*sqrt(-c
2 - 2*c*d*x - d2*x**2 + 1)/(25*d) + 3*a**2*b*c*d**3*e**4*x**4*asin(c +
d*x) + 12*a**2*b*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25
+ 8*a**2*b*c*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 3*a**2*b*d**
4*e**4*x**5*asin(c + d*x)/5 + 3*a**2*b*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)/25 + 4*a**2*b*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/25 + 8*a**2*b*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 3*a
*b**2*c**5*e**4*asin(c + d*x)**2/(5*d) + 3*a*b**2*c**4*e**4*x*asin(c + d*x)
2 - 6*a*b2*c**4*e**4*x/25 + 6*a*b**2*c**4*e**4*sqrt(-c**2 - 2*c*d*x - d
2*x2 + 1)*asin(c + d*x)/(25*d) + 6*a*b**2*c**3*d*e**4*x**2*asin(c + d*x
)**2 - 12*a*b**2*c**3*d*e**4*x**2/25 + 24*a*b**2*c**3*e**4*x*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 + 6*a*b**2*c**2*d**2*e**4*x**3*asi
n(c + d*x)**2 - 12*a*b**2*c**2*d**2*e**4*x**3/25 + 36*a*b**2*c**2*d*e**4*x*
*2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 - 8*a*b**2*c**2*e
4*x/25 + 8*a*b2*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)/(25*d) + 3*a*b**2*c*d**3*e**4*x**4*asin(c + d*x)**2 - 6*a*b**2*c*d**
3*e**4*x**4/25 + 24*a*b**2*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**
2 + 1)*asin(c + d*x)/25 - 8*a*b**2*c*d*e**4*x**2/25 + 16*a*b**2*c*e**4*x*sq
rt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 + 3*a*b**2*d**4*e**4*x
5*asin(c + d*x)2/5 - 6*a*b**2*d**4*e**4*x**5/125 + 6*a*b**2*d**3*e**4*x
4*sqrt(-c2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 - 8*a*b**2*d**2*
e**4*x**3/75 + 8*a*b**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*a
sin(c + d*x)/25 - 16*a*b**2*e**4*x/25 + 16*a*b**2*e**4*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)/(25*d) + b**3*c**5*e**4*asin(c + d*x)**3/(5
*d) - 6*b**3*c**5*e**4*asin(c + d*x)/(125*d) + b**3*c**4*e**4*x*asin(c + d*
x)**3 - 6*b**3*c**4*e**4*x*asin(c + d*x)/25 + 3*b**3*c**4*e**4*sqrt(-c**2 -
 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(25*d) - 6*b**3*c**4*e**4*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/(625*d) + 2*b**3*c**3*d*e**4*x**2*asin(c +
d*x)**3 - 12*b**3*c**3*d*e**4*x**2*asin(c + d*x)/25 + 12*b**3*c**3*e**4*x*s
qrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/25 - 24*b**3*c**3*e**
4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/625 - 8*b**3*c**3*e**4*asin(c + d
*x)/(75*d) + 2*b**3*c**2*d**2*e**4*x**3*asin(c + d*x)**3 - 12*b**3*c**2*d**
2*e**4*x**3*asin(c + d*x)/25 + 18*b**3*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*
x - d**2*x**2 + 1)*asin(c + d*x)**2/25 - 36*b**3*c**2*d*e**4*x**2*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)/625 - 8*b**3*c**2*e**4*x*asin(c + d*x)/25 + 4*
b**3*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(25*d
) - 272*b**3*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(5625*d) + b**
3*c*d**3*e**4*x**4*asin(c + d*x)**3 - 6*b**3*c*d**3*e**4*x**4*asin(c + d*x)
/25 + 12*b**3*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c

```
 + d*x)**2/25 - 24*b**3*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
 1)/625 - 8*b**3*c*d*e**4*x**2*asin(c + d*x)/25 + 8*b**3*c*e**4*x*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/25 - 544*b**3*c*e**4*x*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/5625 - 16*b**3*c*e**4*asin(c + d*x)/(25*d)
+ b**3*d**4*e**4*x**5*asin(c + d*x)**3/5 - 6*b**3*d**4*e**4*x**5*asin(c + d
*x)/125 + 3*b**3*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(
c + d*x)**2/25 - 6*b**3*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1
)/625 - 8*b**3*d**2*e**4*x**3*asin(c + d*x)/75 + 4*b**3*d*e**4*x**2*sqrt(-c
**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/25 - 272*b**3*d*e**4*x**2*s
qrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/5625 - 16*b**3*e**4*x*asin(c + d*x)/25
 + 8*b**3*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(25*d
) - 4144*b**3*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(5625*d), Ne(d, 0)
), (c**4*e**4*x*(a + b*asin(c))**3, True))
```

Maxima [F]

$$\int (ce + dex)^4 (a + b \arcsin(c + dx))^3 \, dx = \int (dex + ce)^4 (b \arcsin(dx + c) + a)^3 \, dx$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/5*a^3*d^4*e^4*x^5 + a^3*c*d^3*e^4*x^4 + 2*a^3*c^2*d^2*e^4*x^3 + 2*a^3*c^3
*d*e^4*x^2 + 3*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt
(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 -
 (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqr
t(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^2*b*c^3*d*e^4 + (6*x^3*arcsin(d*x
 + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d
^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^
2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-
d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a^2*b*c^2*d^2*e^4 + 1/8*(24*x^
4*arcsin(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt
(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sq
rt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^
2*x/d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d
^2))/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)
/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*(c^2 - 1)*c/d^5)*d)*a^2*b*c*d^3*e^4 + 1/200*(120*x^5*arcsin(d*x + c) + (24
*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d^2*x^2 - 2*c*d*x -
c^2 + 1)*c*x^3/d^3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x^2/d^4 - 9
45*c^5*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 315*sqrt(
-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3*x/d^5 - 32*sqrt(-d^2*x^2 - 2*c*d*x - c^2
+ 1)*(c^2 - 1)*x^2/d^4 + 1050*(c^2 - 1)*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*
```

```
d^2 - (c^2 - 1)*d^2))/d^6 + 945*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^4/d^6
+ 161*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c*x/d^5 - 225*(c^2 - 1)^
2*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^6 - 735*sqrt(-d^
2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c^2/d^6 + 64*sqrt(-d^2*x^2 - 2*c*d*x -
 c^2 + 1)*(c^2 - 1)^2/d^6)*d)*a^2*b*d^4*e^4 + a^3*c^4*e^4*x + 3*((d*x + c)*
arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b*c^4*e^4/d + 1/5*(b^3*d^4*e^
4*x^5 + 5*b^3*c*d^3*e^4*x^4 + 10*b^3*c^2*d^2*e^4*x^3 + 10*b^3*c^3*d*e^4*x^2
 + 5*b^3*c^4*e^4*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^
3 + integrate(3/5*((b^3*d^5*e^4*x^5 + 5*b^3*c*d^4*e^4*x^4 + 10*b^3*c^2*d^3*
e^4*x^3 + 10*b^3*c^3*d^2*e^4*x^2 + 5*b^3*c^4*d*e^4*x)*sqrt(d*x + c + 1)*sqr
t(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 +
5*(a*b^2*d^6*e^4*x^6 + 6*a*b^2*c*d^5*e^4*x^5 + (15*a*b^2*c^2 - a*b^2)*d^4*e
^4*x^4 + 4*(5*a*b^2*c^3 - a*b^2*c)*d^3*e^4*x^3 + 3*(5*a*b^2*c^4 - 2*a*b^2*c
^2)*d^2*e^4*x^2 + 2*(3*a*b^2*c^5 - 2*a*b^2*c^3)*d*e^4*x + (a*b^2*c^6 - a*b^
2*c^4)*e^4)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*
x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 832 vs. $2(304) = 608$.

Time = 0.36 (sec) , antiderivative size = 832, normalized size of antiderivative = 2.46

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b^3*e^4*arcsin(d*x + c)^3/d + 1/5*(d*x +
c)^5*a^3*e^4/d + 3/5*((d*x + c)^2 - 1)^2*(d*x + c)*a*b^2*e^4*arcsin(d*x + c
)^2/d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^4*arcsin(d*x + c)^3/d + 3/25*
((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*arcsin(d*x + c)^2/d + 3/
5*((d*x + c)^2 - 1)^2*(d*x + c)*a^2*b*e^4*arcsin(d*x + c)/d - 6/125*((d*x +
 c)^2 - 1)^2*(d*x + c)*b^3*e^4*arcsin(d*x + c)/d + 6/5*((d*x + c)^2 - 1)*(d
*x + c)*a*b^2*e^4*arcsin(d*x + c)^2/d + 1/5*(d*x + c)*b^3*e^4*arcsin(d*x +
c)^3/d + 6/25*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*arcsin(d
*x + c)/d - 2/5*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^4*arcsin(d*x + c)^2/d - 6/12
5*((d*x + c)^2 - 1)^2*(d*x + c)*a*b^2*e^4/d + 6/5*((d*x + c)^2 - 1)*(d*x +
c)*a^2*b*e^4*arcsin(d*x + c)/d - 76/375*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^4
*arcsin(d*x + c)/d + 3/5*(d*x + c)*a*b^2*e^4*arcsin(d*x + c)^2/d + 3/25*((d
*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a^2*b*e^4/d - 6/625*((d*x + c)^2 -
1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4/d - 4/5*(-(d*x + c)^2 + 1)^(3/2)*a*b^2*
e^4*arcsin(d*x + c)/d + 3/5*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*arcsin(d*x + c)^
2/d - 76/375*((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^4/d + 3/5*(d*x + c)*a^2*b*
e^4*arcsin(d*x + c)/d - 298/375*(d*x + c)*b^3*e^4*arcsin(d*x + c)/d - 2/5*(
-(d*x + c)^2 + 1)^(3/2)*a^2*b*e^4/d + 76/1125*(-(d*x + c)^2 + 1)^(3/2)*b^3*
```

```
e^4/d + 6/5*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*arcsin(d*x + c)/d - 298/375*(d
*x + c)*a*b^2*e^4/d + 3/5*sqrt(-(d*x + c)^2 + 1)*a^2*b*e^4/d - 298/375*sqrt
(-(d*x + c)^2 + 1)*b^3*e^4/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)^4\,(a+b\,\mathrm{asin}(c+d\,x))^3\,dx$$

```
[In] int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^3, x)
```

3.198 $\int (ce + dex)^3 (a + b \arcsin(c + dx))^3 \, dx$

Optimal result

Integrand size = 23, antiderivative size = 287

$$\begin{aligned}
\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx
&= -\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}}{256d}-\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{128d}\\
&\quad+\frac{45b^3e^3\arcsin(c+dx)}{256d}-\frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d}\\
&\quad-\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d}\\
&\quad+\frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d}\\
&\quad+\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d}\\
&\quad-\frac{3e^3(a+b\arcsin(c+dx))^3}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d}
\end{aligned}$$

```
[Out] 45/256*b^3*e^3*arcsin(d*x+c)/d-9/32*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))/d
-3/32*b^2*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))/d-3/32*e^3*(a+b*arcsin(d*x+c))^
3/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^3/d-45/256*b^3*e^3*(d*x+c)*(1-(d*
x+c)^2)^(1/2)/d-3/128*b^3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/d+9/32*b*e^3*(d
*x+c)*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+3/16*b*e^3*(d*x+c)^3*(a+b
*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4889, 12, 4723, 4795, 4737, 327, 222}

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$
$$= -\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d} + \frac{3be^3\sqrt{1-(c+dx)^2}(c+dx)^3(a+b\arcsin(c+dx))^2}{16d} + \frac{9be^3\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+dx))^2}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^3}{32d} + \frac{45b^3e^3\arcsin(c+dx)}{256d} - \frac{3b^3e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{128d} - \frac{45b^3e^3\sqrt{1-(c+dx)^2}(c+dx)}{256d}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (-45*b^3*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(256*d) - (3*b^3*e^3*(c + d*x
)^3*Sqrt[1 - (c + d*x)^2])/(128*d) + (45*b^3*e^3*ArcSin[c + d*x])/(256*d) -
 (9*b^2*e^3*(c + d*x)^2*(a + b*ArcSin[c + d*x]))/(32*d) - (3*b^2*e^3*(c + d
*x)^4*(a + b*ArcSin[c + d*x]))/(32*d) + (9*b*e^3*(c + d*x)*Sqrt[1 - (c + d*
x)^2]*(a + b*ArcSin[c + d*x])^2)/(32*d) + (3*b*e^3*(c + d*x)^3*Sqrt[1 - (c
+ d*x)^2]*(a + b*ArcSin[c + d*x])^2)/(16*d) - (3*e^3*(a + b*ArcSin[c + d*x]
)^3)/(32*d) + (e^3*(c + d*x)^4*(a + b*ArcSin[c + d*x])^3)/(4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d}-\frac{(3be^3)\,\text{Subst}\left(\int \frac{x^4(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d} \\
&+ \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d} \\
&- \frac{(9be^3)\operatorname{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{16d} \\
&- \frac{(3b^2e^3)\operatorname{Subst}\left(\int x^3(a+b\arcsin(x))\,dx, x, c+dx\right)}{8d} \\
&= -\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d} \\
&+ \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d} \\
&+ \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d} \\
&+ \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d} - \frac{(9be^3)\operatorname{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{32d} \\
&- \frac{(9b^2e^3)\operatorname{Subst}\left(\int x(a+b\arcsin(x))\,dx, x, c+dx\right)}{16d} \\
&+ \frac{(3b^3e^3)\operatorname{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{32d} \\
&= -\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{128d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d} \\
&- \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d} \\
&+ \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d} \\
&+ \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d} \\
&- \frac{3e^3(a+b\arcsin(c+dx))^3}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d} \\
&+ \frac{(9b^3e^3)\operatorname{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{128d} + \frac{(9b^3e^3)\operatorname{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{32d}
\end{aligned}
$$

$$= -\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}}{256d} - \frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{128d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d} - \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d} + \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d} - \frac{3e^3(a+b\arcsin(c+dx))^3}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d} + \frac{(9b^3e^3)\,\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{256d} + \frac{(9b^3e^3)\,\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{64d}$$

$$= -\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}}{256d} - \frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{128d} + \frac{45b^3e^3\arcsin(c+dx)}{256d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d} - \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d} + \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d} - \frac{3e^3(a+b\arcsin(c+dx))^3}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.81

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$

$$= \frac{e^3\left((c+dx)^4(a+b\arcsin(c+dx))^3 - \frac{3}{8}\left(\frac{15}{8}b^3(c+dx)\sqrt{1-(c+dx)^2} + \frac{1}{4}b^3(c+dx)^3\sqrt{1-(c+dx)^2} - \frac{1}{8}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e^3*((c + d*x)^4*(a + b*ArcSin[c + d*x])^3 - (3*((15*b^3*(c + d*x)*Sqrt[1
- (c + d*x)^2])/8 + (b^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/4 - (15*b^3*Arc
Sin[c + d*x])/8 + 3*b^2*(c + d*x)^2*(a + b*ArcSin[c + d*x]) + b^2*(c + d*x)
^4*(a + b*ArcSin[c + d*x]) - 3*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*Arc
Sin[c + d*x])^2 - 2*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d
*x])^2 + (a + b*ArcSin[c + d*x])^3))/8))/(4*d)
```

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.37

method	result
derivativedivides	$\frac{\frac{e^3a^3(dx+c)^4}{4}+e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{32}-\right.}{}$
default	$\frac{\frac{e^3a^3(dx+c)^4}{4}+e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{32}-\right.}{}$
parts	$\frac{e^3a^3(dx+c)^4}{4d}+\frac{e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{32}\right.}{}$

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
[Out] 1/d*(1/4*e^3*a^3*(d*x+c)^4+e^3*b^3*(1/4*(d*x+c)^4*arcsin(d*x+c)^3-3/32*arcs
in(d*x+c)^2*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)
+3*arcsin(d*x+c))-3/32*(d*x+c)^4*arcsin(d*x+c)-3/256*(d*x+c)*(2*(d*x+c)^2+3
)*(1-(d*x+c)^2)^(1/2)-27/256*arcsin(d*x+c)-9/32*((d*x+c)^2-1)*arcsin(d*x+c)
-9/64*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3/16*arcsin(d*x+c)^3)+3*e^3*a*b^2*(1/4*(d
*x+c)^4*arcsin(d*x+c)^2-1/16*arcsin(d*x+c)*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2
)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c))+3/32*arcsin(d*x+c)^2-1/128
*(2*(d*x+c)^2+3)^2)+3*e^3*a^2*b*(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*(d*x+c)^3
*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 769 vs. 2(261) = 522.

Time = 0.31 (sec) , antiderivative size = 769, normalized size of antiderivative = 2.68

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{8\,(8\,a^3-3\,ab^2)d^4e^3x^4+32\,(8\,a^3-3\,ab^2)cd^3e^3x^3-24\,(3\,ab^2-2\,(8\,a^3-3\,ab^2)c^2)d^2e^3x^2-16\,(9\,ab^2c-2\,(8\,a}{}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
[Out] 1/256*(8*(8*a^3 - 3*a*b^2)*d^4*e^3*x^4 + 32*(8*a^3 - 3*a*b^2)*c*d^3*e^3*x^3
 - 24*(3*a*b^2 - 2*(8*a^3 - 3*a*b^2)*c^2)*d^2*e^3*x^2 - 16*(9*a*b^2*c - 2*(
8*a^3 - 3*a*b^2)*c^3)*d*e^3*x + 8*(8*b^3*d^4*e^3*x^4 + 32*b^3*c*d^3*e^3*x^3
 + 48*b^3*c^2*d^2*e^3*x^2 + 32*b^3*c^3*d*e^3*x + (8*b^3*c^4 - 3*b^3)*e^3)*a
rcsin(d*x + c)^3 + 24*(8*a*b^2*d^4*e^3*x^4 + 32*a*b^2*c*d^3*e^3*x^3 + 48*a*
b^2*c^2*d^2*e^3*x^2 + 32*a*b^2*c^3*d*e^3*x + (8*a*b^2*c^4 - 3*a*b^2)*e^3)*a
```

```
rcsin(d*x + c)^2 + 3*(8*(8*a^2*b - b^3)*d^4*e^3*x^4 + 32*(8*a^2*b - b^3)*c*
d^3*e^3*x^3 - 24*(b^3 - 2*(8*a^2*b - b^3)*c^2)*d^2*e^3*x^2 - 16*(3*b^3*c -
2*(8*a^2*b - b^3)*c^3)*d*e^3*x - (24*b^3*c^2 - 8*(8*a^2*b - b^3)*c^4 + 24*a
^2*b - 15*b^3)*e^3)*arcsin(d*x + c) + 3*(2*(8*a^2*b - b^3)*d^3*e^3*x^3 + 6*
(8*a^2*b - b^3)*c*d^2*e^3*x^2 + 3*(8*a^2*b - 5*b^3 + 2*(8*a^2*b - b^3)*c^2)
*d*e^3*x + (2*(8*a^2*b - b^3)*c^3 + 3*(8*a^2*b - 5*b^3)*c)*e^3 + 8*(2*b^3*d
^3*e^3*x^3 + 6*b^3*c*d^2*e^3*x^2 + 3*(2*b^3*c^2 + b^3)*d*e^3*x + (2*b^3*c^3
 + 3*b^3*c)*e^3)*arcsin(d*x + c)^2 + 16*(2*a*b^2*d^3*e^3*x^3 + 6*a*b^2*c*d^
2*e^3*x^2 + 3*(2*a*b^2*c^2 + a*b^2)*d*e^3*x + (2*a*b^2*c^3 + 3*a*b^2*c)*e^3
)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1828 vs. $2(260) = 520$.

Time = 0.76 (sec) , antiderivative size = 1828, normalized size of antiderivative = 6.37

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*c**3*e**3*x + 3*a**3*c**2*d*e**3*x**2/2 + a**3*c*d**2*e**3*
x**3 + a**3*d**3*e**3*x**4/4 + 3*a**2*b*c**4*e**3*asin(c + d*x)/(4*d) + 3*a
**2*b*c**3*e**3*x*asin(c + d*x) + 3*a**2*b*c**3*e**3*sqrt(-c**2 - 2*c*d*x -
 d**2*x**2 + 1)/(16*d) + 9*a**2*b*c**2*d*e**3*x**2*asin(c + d*x)/2 + 9*a**2
*b*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*a**2*b*c*d**2*e
**3*x**3*asin(c + d*x) + 9*a**2*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2
*x**2 + 1)/16 + 9*a**2*b*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(32*d
) + 3*a**2*b*d**3*e**3*x**4*asin(c + d*x)/4 + 3*a**2*b*d**2*e**3*x**3*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 9*a**2*b*e**3*x*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)/32 - 9*a**2*b*e**3*asin(c + d*x)/(32*d) + 3*a*b**2*c**4*e*
*3*asin(c + d*x)**2/(4*d) + 3*a*b**2*c**3*e**3*x*asin(c + d*x)**2 - 3*a*b**
2*c**3*e**3*x/8 + 3*a*b**2*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*
asin(c + d*x)/(8*d) + 9*a*b**2*c**2*d*e**3*x**2*asin(c + d*x)**2/2 - 9*a*b*
*2*c**2*d*e**3*x**2/16 + 9*a*b**2*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x
**2 + 1)*asin(c + d*x)/8 + 3*a*b**2*c*d**2*e**3*x**3*asin(c + d*x)**2 - 3*a
*b**2*c*d**2*e**3*x**3/8 + 9*a*b**2*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)*asin(c + d*x)/8 - 9*a*b**2*c*e**3*x/16 + 9*a*b**2*c*e**3*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(16*d) + 3*a*b**2*d**3*e**3*
x**4*asin(c + d*x)**2/4 - 3*a*b**2*d**3*e**3*x**4/32 + 3*a*b**2*d**2*e**3*x
**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/8 - 9*a*b**2*d*e**3
*x**2/32 + 9*a*b**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d
*x)/16 - 9*a*b**2*e**3*asin(c + d*x)**2/(32*d) + b**3*c**4*e**3*asin(c + d*
x)**3/(4*d) - 3*b**3*c**4*e**3*asin(c + d*x)/(32*d) + b**3*c**3*e**3*x*asin
(c + d*x)**3 - 3*b**3*c**3*e**3*x*asin(c + d*x)/8 + 3*b**3*c**3*e**3*sqrt(-
```

```
c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(16*d) - 3*b**3*c**3*e**3*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(128*d) + 3*b**3*c**2*d*e**3*x**2*asi
n(c + d*x)**3/2 - 9*b**3*c**2*d*e**3*x**2*asin(c + d*x)/16 + 9*b**3*c**2*e*
*3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/16 - 9*b**3*c**
2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/128 - 9*b**3*c**2*e**3*asin(
c + d*x)/(32*d) + b**3*c*d**2*e**3*x**3*asin(c + d*x)**3 - 3*b**3*c*d**2*e*
*3*x**3*asin(c + d*x)/8 + 9*b**3*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*
x**2 + 1)*asin(c + d*x)**2/16 - 9*b**3*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x -
 d**2*x**2 + 1)/128 - 9*b**3*c*e**3*x*asin(c + d*x)/16 + 9*b**3*c*e**3*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(32*d) - 45*b**3*c*e**3*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(256*d) + b**3*d**3*e**3*x**4*asin(c
+ d*x)**3/4 - 3*b**3*d**3*e**3*x**4*asin(c + d*x)/32 + 3*b**3*d**2*e**3*x**
3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/16 - 3*b**3*d**2*e
**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/128 - 9*b**3*d*e**3*x**2*asi
n(c + d*x)/32 + 9*b**3*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)**2/32 - 45*b**3*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/256 - 3
*b**3*e**3*asin(c + d*x)**3/(32*d) + 45*b**3*e**3*asin(c + d*x)/(256*d), Ne
(d, 0)), (c**3*e**3*x*(a + b*asin(c))**3, True))
```

Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)^3(b\arcsin(dx+c)+a)^3\,dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^3*d^3*e^3*x^4 + a^3*c*d^2*e^3*x^3 + 3/2*a^3*c^2*d*e^3*x^2 + 9/4*(2*x^
2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)
*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(
d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1)*c/d^3))*a^2*b*c^2*d*e^3 + 1/2*(6*x^3*arcsin(d*x + c) + d*(2*sqr
t(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt
(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d
^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4
 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1)*(c^2 - 1)/d^4))*a^2*b*c*d^2*e^3 + 1/32*(24*x^4*arcsin(d*x + c)
 + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2*c*d
*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2
 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*(c^2
 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 105*sq
rt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2
+ 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (
c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)
*d)*a^2*b*d^3*e^3 + a^3*c^3*e^3*x + 3*((d*x + c)*arcsin(d*x + c) + sqrt(-(d
```

```
*x + c)^2 + 1))*a^2*b*c^3*e^3/d + 1/4*(b^3*d^3*e^3*x^4 + 4*b^3*c*d^2*e^3*x^
3 + 6*b^3*c^2*d*e^3*x^2 + 4*b^3*c^3*e^3*x)*arctan2(d*x + c, sqrt(d*x + c +
1)*sqrt(-d*x - c + 1))^3 + integrate(3/4*((b^3*d^4*e^3*x^4 + 4*b^3*c*d^3*e^
3*x^3 + 6*b^3*c^2*d^2*e^3*x^2 + 4*b^3*c^3*d*e^3*x)*sqrt(d*x + c + 1)*sqrt(-
d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 4*(
a*b^2*d^5*e^3*x^5 + 5*a*b^2*c*d^4*e^3*x^4 + (10*a*b^2*c^2 - a*b^2)*d^3*e^3*
x^3 + (10*a*b^2*c^3 - 3*a*b^2*c)*d^2*e^3*x^2 + (5*a*b^2*c^4 - 3*a*b^2*c^2)*
d*e^3*x + (a*b^2*c^5 - a*b^2*c^3)*e^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*s
qrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 641 vs. $2(261) = 522$.

Time = 0.35 (sec) , antiderivative size = 641, normalized size of antiderivative = 2.23

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{\left((dx+c)^2-1\right)^2 b^3e^3\arcsin\left(dx+c\right)^3}{4\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^3e^3\arcsin\left(dx+c\right)^2}{16\,d} + \frac{(dx+c)^4a^3e^3}{4\,d} + \frac{3\left((dx+c)^2-1\right)^2 ab^2e^3\arcsin\left(dx+c\right)^2}{4\,d} + \frac{\left((dx+c)^2-1\right)b^3e^3\arcsin\left(dx+c\right)^3}{2\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)ab^2e^3\arcsin\left(dx+c\right)}{8\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)b^3e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{3\left((dx+c)^2-1\right)^2 a^2be^3\arcsin\left(dx+c\right)}{4\,d} - \frac{3\left((dx+c)^2-1\right)^2 b^3e^3\arcsin\left(dx+c\right)}{32\,d} + \frac{3\left((dx+c)^2-1\right)ab^2e^3\arcsin\left(dx+c\right)^2}{2\,d} + \frac{5\,b^3e^3\arcsin\left(dx+c\right)^3}{32\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)a^2be^3}{16\,d} + \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^3e^3}{128\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)ab^2e^3\arcsin\left(dx+c\right)}{16\,d} - \frac{3\left((dx+c)^2-1\right)^2 ab^2e^3}{32\,d} + \frac{3\left((dx+c)^2-1\right)a^2be^3\arcsin\left(dx+c\right)}{2\,d} - \frac{15\left((dx+c)^2-1\right)b^3e^3\arcsin\left(dx+c\right)}{32\,d} + \frac{15\,ab^2e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)a^2be^3}{32\,d} - \frac{51\sqrt{-(dx+c)^2+1}(dx+c)b^3e^3}{256\,d} - \frac{15\left((dx+c)^2-1\right)ab^2e^3}{32\,d} + \frac{15\,a^2be^3\arcsin\left(dx+c\right)}{32\,d} - \frac{51\,b^3e^3\arcsin\left(dx+c\right)}{256\,d} - \frac{51\,ab^2e^3}{256\,d}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/4*((d*x + c)^2 - 1)^2*b^3*e^3*arcsin(d*x + c)^3/d - 3/16*(-(d*x + c)^2 +
1)^(3/2)*(d*x + c)*b^3*e^3*arcsin(d*x + c)^2/d + 1/4*(d*x + c)^4*a^3*e^3/d
+ 3/4*((d*x + c)^2 - 1)^2*a*b^2*e^3*arcsin(d*x + c)^2/d + 1/2*((d*x + c)^2
- 1)*b^3*e^3*arcsin(d*x + c)^3/d - 3/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a
*b^2*e^3*arcsin(d*x + c)/d + 15/32*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e^3
*arcsin(d*x + c)^2/d + 3/4*((d*x + c)^2 - 1)^2*a^2*b*e^3*arcsin(d*x + c)/d
- 3/32*((d*x + c)^2 - 1)^2*b^3*e^3*arcsin(d*x + c)/d + 3/2*((d*x + c)^2 - 1
```

```
)*a*b^2*e^3*arcsin(d*x + c)^2/d + 5/32*b^3*e^3*arcsin(d*x + c)^3/d - 3/16*(
-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^2*b*e^3/d + 3/128*(-(d*x + c)^2 + 1)^(3
/2)*(d*x + c)*b^3*e^3/d + 15/16*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a*b^2*e^3*
arcsin(d*x + c)/d - 3/32*((d*x + c)^2 - 1)^2*a*b^2*e^3/d + 3/2*((d*x + c)^2
 - 1)*a^2*b*e^3*arcsin(d*x + c)/d - 15/32*((d*x + c)^2 - 1)*b^3*e^3*arcsin(
d*x + c)/d + 15/32*a*b^2*e^3*arcsin(d*x + c)^2/d + 15/32*sqrt(-(d*x + c)^2
+ 1)*(d*x + c)*a^2*b*e^3/d - 51/256*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e^
3/d - 15/32*((d*x + c)^2 - 1)*a*b^2*e^3/d + 15/32*a^2*b*e^3*arcsin(d*x + c)
/d - 51/256*b^3*e^3*arcsin(d*x + c)/d - 51/256*a*b^2*e^3/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^3\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^3,x)
```

```
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^3, x)
```

3.199 $\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 235

$$\begin{aligned}
&\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx \\
&= -\frac{4}{3}ab^2e^2x-\frac{14b^3e^2\sqrt{1-(c+dx)^2}}{9d}+\frac{2b^3e^2\left(1-(c+dx)^2\right)^{3/2}}{27d} \\
&\quad-\frac{4b^3e^2(c+dx)\arcsin(c+dx)}{3d}-\frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d} \\
&\quad+\frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} \\
&\quad+\frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} \\
&\quad+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d}
\end{aligned}$$

```
[Out] -4/3*a*b^2*e^2*x+2/27*b^3*e^2*(1-(d*x+c)^2)^(3/2)/d-4/3*b^3*e^2*(d*x+c)*arc
sin(d*x+c)/d-2/9*b^2*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))/d+1/3*e^2*(d*x+c)^3*
(a+b*arcsin(d*x+c))^3/d-14/9*b^3*e^2*(1-(d*x+c)^2)^(1/2)/d+2/3*b*e^2*(a+b*a
rcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+1/3*b*e^2*(d*x+c)^2*(a+b*arcsin(d*x+c
))^2*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4889, 12, 4723, 4795, 4767, 4715, 267, 272, 45}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$$
$$= -\frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d}+\frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d}$$
$$+\frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d}$$
$$+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d}-\frac{4}{3}ab^2e^2x-\frac{4b^3e^2(c+dx)\arcsin(c+dx)}{3d}$$
$$+\frac{2b^3e^2\left(1-(c+dx)^2\right)^{3/2}}{27d}-\frac{14b^3e^2\sqrt{1-(c+dx)^2}}{9d}$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (-4*a*b^2*e^2*x)/3 - (14*b^3*e^2*Sqrt[1 - (c + d*x)^2])/(9*d) + (2*b^3*e^2*
(1 - (c + d*x)^2)^(3/2))/(27*d) - (4*b^3*e^2*(c + d*x)*ArcSin[c + d*x])/(3*
d) - (2*b^2*e^2*(c + d*x)^3*(a + b*ArcSin[c + d*x]))/(9*d) + (2*b*e^2*Sqrt[
1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2)/(3*d) + (b*e^2*(c + d*x)^2*Sqrt
[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2)/(3*d) + (e^2*(c + d*x)^3*(a +
b*ArcSin[c + d*x])^3)/(3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^3\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}$$

$$= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}$$

$$= \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d} - \frac{(2be^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3d} - \frac{(2b^2e^2)\,\text{Subst}\left(\int x^2(a+b\arcsin(x))\,dx,x,c+dx\right)}{3d}$$

$$= -\frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d} + \frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d} - \frac{(4b^2e^2)\,\text{Subst}\left(\int (a+b\arcsin(x))\,dx,x,c+dx\right)}{3d} + \frac{(2b^3e^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{9d}$$

$$= -\frac{4}{3}ab^2e^2x - \frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d} + \frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d} + \frac{(b^3e^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x}}\,dx,x,(c+dx)^2\right)}{9d} - \frac{(4b^3e^2)\,\text{Subst}\left(\int \arcsin(x)\,dx,x,c+dx\right)}{3d}$$

$$= -\frac{4}{3}ab^2e^2x - \frac{4b^3e^2(c+dx)\arcsin(c+dx)}{3d} - \frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d} + \frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d} + \frac{(b^3e^2)\,\text{Subst}\left(\int \left(\frac{1}{\sqrt{1-x}}-\sqrt{1-x}\right)\,dx,x,(c+dx)^2\right)}{9d} + \frac{(4b^3e^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3d}$$

$$= -\frac{4}{3}ab^2e^2x - \frac{14b^3e^2\sqrt{1-(c+dx)^2}}{9d} + \frac{2b^3e^2(1-(c+dx)^2)^{3/2}}{27d} - \frac{4b^3e^2(c+dx)\arcsin(c+dx)}{3d} - \frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d} + \frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.85

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx = \frac{e^2\left((c+dx)^3(a+b\arcsin(c+dx))^3 - b\left(\frac{2}{9}b^2(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2} + \frac{2}{3}b(c+dx)^3(a+b\,\text{ar}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e^2*((c + d*x)^3*(a + b*ArcSin[c + d*x])^3 - b*((2*b^2*(2 + c^2 + 2*c*d*x
+ d^2*x^2)*Sqrt[1 - (c + d*x)^2])/9 + (2*b*(c + d*x)^3*(a + b*ArcSin[c + d*
x]))/3 - 2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - (c + d*x)^2*Sq
rt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 + 4*b*(a*d*x + b*Sqrt[1 - (c
+ d*x)^2] + b*(c + d*x)*ArcSin[c + d*x]))))/(3*d)
```

Maple [A] (verified)

Time = 1.05 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.19

method	result
derivativedivides	$\frac{\frac{e^2a^3(dx+c)^3}{3}+b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx+c)}{3}-\right.}{}$
default	$\frac{\frac{e^2a^3(dx+c)^3}{3}+b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx+c)}{3}-\right.}{}$
parts	$\frac{e^2a^3(dx+c)^3}{3d}+\frac{b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx+c}{3}\right.}{d}$

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/3*e^2*a^3*(d*x+c)^3+b^3*e^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^3+1/3*arcsi
n(d*x+c)^2*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-4/3*(1-(d*x+c)^2)^(1/2)-4/3*(d
*x+c)*arcsin(d*x+c)-2/9*(d*x+c)^3*arcsin(d*x+c)-2/27*((d*x+c)^2+2)*(1-(d*x+
c)^2)^(1/2))+3*e^2*a*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcsin(d*x+c)*(
```

```
(d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+3*e^2*a^2*b*
(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2/9*(1-(d*x+
c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 530 vs. $2(211) = 422$.

Time = 0.28 (sec) , antiderivative size = 530, normalized size of antiderivative = 2.26

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx = \frac{3\,(3\,a^3-2\,ab^2)d^3e^2x^3+9\,(3\,a^3-2\,ab^2)cd^2e^2x^2-9\,(4\,ab^2-(3\,a^3-2\,ab^2)c^2)de^2x+9\,(b^3d^3e^2x^3+3\,b^3cd^2e}{}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/27*(3*(3*a^3 - 2*a*b^2)*d^3*e^2*x^3 + 9*(3*a^3 - 2*a*b^2)*c*d^2*e^2*x^2 -
 9*(4*a*b^2 - (3*a^3 - 2*a*b^2)*c^2)*d*e^2*x + 9*(b^3*d^3*e^2*x^3 + 3*b^3*c
*d^2*e^2*x^2 + 3*b^3*c^2*d*e^2*x + b^3*c^3*e^2)*arcsin(d*x + c)^3 + 27*(a*b
^2*d^3*e^2*x^3 + 3*a*b^2*c*d^2*e^2*x^2 + 3*a*b^2*c^2*d*e^2*x + a*b^2*c^3*e^
2)*arcsin(d*x + c)^2 + 3*((9*a^2*b - 2*b^3)*d^3*e^2*x^3 + 3*(9*a^2*b - 2*b^
3)*c*d^2*e^2*x^2 - 3*(4*b^3 - (9*a^2*b - 2*b^3)*c^2)*d*e^2*x - (12*b^3*c -
(9*a^2*b - 2*b^3)*c^3)*e^2)*arcsin(d*x + c) + ((9*a^2*b - 2*b^3)*d^2*e^2*x^
2 + 2*(9*a^2*b - 2*b^3)*c*d*e^2*x + (18*a^2*b - 40*b^3 + (9*a^2*b - 2*b^3)*
c^2)*e^2 + 9*(b^3*d^2*e^2*x^2 + 2*b^3*c*d*e^2*x + (b^3*c^2 + 2*b^3)*e^2)*ar
csin(d*x + c)^2 + 18*(a*b^2*d^2*e^2*x^2 + 2*a*b^2*c*d*e^2*x + (a*b^2*c^2 +
2*a*b^2)*e^2)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1173 vs. $2(211) = 422$.

Time = 0.49 (sec) , antiderivative size = 1173, normalized size of antiderivative = 4.99

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*c**2*e**2*x + a**3*c*d*e**2*x**2 + a**3*d**2*e**2*x**3/3 +
a**2*b*c**3*e**2*asin(c + d*x)/d + 3*a**2*b*c**2*e**2*x*asin(c + d*x) + a**
2*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(3*d) + 3*a**2*b*c*d*e*
*2*x**2*asin(c + d*x) + 2*a**2*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2
+ 1)/3 + a**2*b*d**2*e**2*x**3*asin(c + d*x) + a**2*b*d*e**2*x**2*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)/3 + 2*a**2*b*e**2*sqrt(-c**2 - 2*c*d*x - d**2*
```

```
x**2 + 1)/(3*d) + a*b**2*c**3*e**2*asin(c + d*x)**2/d + 3*a*b**2*c**2*e**2*
x*asin(c + d*x)**2 - 2*a*b**2*c**2*e**2*x/3 + 2*a*b**2*c**2*e**2*sqrt(-c**2
 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d) + 3*a*b**2*c*d*e**2*x**2*as
in(c + d*x)**2 - 2*a*b**2*c*d*e**2*x**2/3 + 4*a*b**2*c*e**2*x*sqrt(-c**2 -
2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/3 + a*b**2*d**2*e**2*x**3*asin(c + d
*x)**2 - 2*a*b**2*d**2*e**2*x**3/9 + 2*a*b**2*d*e**2*x**2*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)*asin(c + d*x)/3 - 4*a*b**2*e**2*x/3 + 4*a*b**2*e**2*sq
rt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d) + b**3*c**3*e**2*as
in(c + d*x)**3/(3*d) - 2*b**3*c**3*e**2*asin(c + d*x)/(9*d) + b**3*c**2*e**
2*x*asin(c + d*x)**3 - 2*b**3*c**2*e**2*x*asin(c + d*x)/3 + b**3*c**2*e**2*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(3*d) - 2*b**3*c**2*
e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(27*d) + b**3*c*d*e**2*x**2*asin
(c + d*x)**3 - 2*b**3*c*d*e**2*x**2*asin(c + d*x)/3 + 2*b**3*c*e**2*x*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/3 - 4*b**3*c*e**2*x*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)/27 - 4*b**3*c*e**2*asin(c + d*x)/(3*d) + b
**3*d**2*e**2*x**3*asin(c + d*x)**3/3 - 2*b**3*d**2*e**2*x**3*asin(c + d*x)
/9 + b**3*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**
2/3 - 2*b**3*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/27 - 4*b**3*
e**2*x*asin(c + d*x)/3 + 2*b**3*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*
asin(c + d*x)**2/(3*d) - 40*b**3*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)
/(27*d), Ne(d, 0)), (c**2*e**2*x*(a + b*asin(c))**3, True))
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)^2(b\arcsin(dx+c)+a)^3\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/3*a^3*d^2*e^2*x^3 + a^3*c*d*e^2*x^2 + 3/2*(2*x^2*arcsin(d*x + c) + d*(3*c
^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2
- (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^2*b*
c*d*e^2 + 1/6*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d
^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(
d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))
*a^2*b*d^2*e^2 + a^3*c^2*e^2*x + 3*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x
+ c)^2 + 1))*a^2*b*c^2*e^2/d + 1/3*(b^3*d^2*e^2*x^3 + 3*b^3*c*d*e^2*x^2 + 3
*b^3*c^2*e^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 +
integrate(((b^3*d^3*e^2*x^3 + 3*b^3*c*d^2*e^2*x^2 + 3*b^3*c^2*d*e^2*x)*sqrt
(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1))^2 + 3*(a*b^2*d^4*e^2*x^4 + 4*a*b^2*c*d^3*e^2*x^3 + (6*a*b^2*c^
```

```
2 - a*b^2)*d^2*e^2*x^2 + 2*(2*a*b^2*c^3 - a*b^2*c)*d*e^2*x + (a*b^2*c^4 - a
*b^2*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d
^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 504 vs. $2(211) = 422$.

Time = 0.35 (sec) , antiderivative size = 504, normalized size of antiderivative = 2.14

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx = \frac{\left((dx+c)^2-1\right)(dx+c)b^3e^2\arcsin\left(dx+c\right)^3}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)ab^2e^2\arcsin\left(dx+c\right)^2}{d} + \frac{(dx+c)b^3e^2\arcsin\left(dx+c\right)^3}{3\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^3e^2\arcsin\left(dx+c\right)^2}{3\,d} + \frac{(dx+c)^3a^3e^2}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)a^2be^2\arcsin\left(dx+c\right)}{d} - \frac{2\left((dx+c)^2-1\right)(dx+c)b^3e^2\arcsin\left(dx+c\right)}{9\,d} + \frac{(dx+c)ab^2e^2\arcsin\left(dx+c\right)^2}{d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}ab^2e^2\arcsin\left(dx+c\right)}{3\,d} + \frac{\sqrt{-(dx+c)^2+1}b^3e^2\arcsin\left(dx+c\right)^2}{d} - \frac{2\left((dx+c)^2-1\right)(dx+c)ab^2e^2}{9\,d} + \frac{(dx+c)a^2be^2\arcsin\left(dx+c\right)}{d} - \frac{14\,(dx+c)b^3e^2\arcsin\left(dx+c\right)}{9\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}a^2be^2}{3\,d} + \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^3e^2}{27\,d} + \frac{2\sqrt{-(dx+c)^2+1}ab^2e^2\arcsin\left(dx+c\right)}{d} - \frac{14\,(dx+c)ab^2e^2}{9\,d} + \frac{\sqrt{-(dx+c)^2+1}a^2be^2}{d} - \frac{14\sqrt{-(dx+c)^2+1}b^3e^2}{9\,d}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/3*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^2*arcsin(d*x + c)^3/d + ((d*x + c)^2
- 1)*(d*x + c)*a*b^2*e^2*arcsin(d*x + c)^2/d + 1/3*(d*x + c)*b^3*e^2*arcsin
(d*x + c)^3/d - 1/3*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2*arcsin(d*x + c)^2/d +
1/3*(d*x + c)^3*a^3*e^2/d + ((d*x + c)^2 - 1)*(d*x + c)*a^2*b*e^2*arcsin(d*
x + c)/d - 2/9*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^2*arcsin(d*x + c)/d + (d*x
 + c)*a*b^2*e^2*arcsin(d*x + c)^2/d - 2/3*(-(d*x + c)^2 + 1)^(3/2)*a*b^2*e^
2*arcsin(d*x + c)/d + sqrt(-(d*x + c)^2 + 1)*b^3*e^2*arcsin(d*x + c)^2/d -
2/9*((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^2/d + (d*x + c)*a^2*b*e^2*arcsin(d*
x + c)/d - 14/9*(d*x + c)*b^3*e^2*arcsin(d*x + c)/d - 1/3*(-(d*x + c)^2 + 1
)^(3/2)*a^2*b*e^2/d + 2/27*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2/d + 2*sqrt(-(d*
x + c)^2 + 1)*a*b^2*e^2*arcsin(d*x + c)/d - 14/9*(d*x + c)*a*b^2*e^2/d + sq
rt(-(d*x + c)^2 + 1)*a^2*b*e^2/d - 14/9*sqrt(-(d*x + c)^2 + 1)*b^3*e^2/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx=\int {\left(c\,e+d\,e\,x\right)}^2\,{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3 \,d x$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^3,x)
```

```
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^3, x)
```

3.200 $\int (ce+dex)(a+b\arcsin (c+dx))^3 \, dx$

Optimal result

Integrand size = 21, antiderivative size = 165

$$\begin{aligned}\int (ce+dex)(a+b\arcsin (c+dx))^3 \, dx &= -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}}{8d}+\frac{3b^3e\arcsin (c+dx)}{8d} \\ &\quad -\frac{3b^2e(c+dx)^2(a+b\arcsin (c+dx))}{4d} \\ &\quad +\frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))^2}{4d} \\ &\quad -\frac{e(a+b\arcsin (c+dx))^3}{4d}+\frac{e(c+dx)^2(a+b\arcsin (c+dx))^3}{2d}\end{aligned}$$

```
[Out] 3/8*b^3*e*arcsin(d*x+c)/d-3/4*b^2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))/d-1/4*e*(
a+b*arcsin(d*x+c))^3/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^3/d-3/8*b^3*e*(d
*x+c)*(1-(d*x+c)^2)^(1/2)/d+3/4*b*e*(d*x+c)*(a+b*arcsin(d*x+c))^2*(1-(d*x+c
)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used

$= \{4889, 12, 4723, 4795, 4737, 327, 222\}$

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx = -\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))}{4d} + \frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d} - \frac{e(a+b\arcsin(c+dx))^3}{4d} + \frac{3b^3e\arcsin(c+dx)}{8d} - \frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}}{8d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (-3*b^3*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(8*d) + (3*b^3*e*ArcSin[c + d*x]
)/(8*d) - (3*b^2*e*(c + d*x)^2*(a + b*ArcSin[c + d*x]))/(4*d) + (3*b*e*(c +
 d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2)/(4*d) - (e*(a + b*Ar
cSin[c + d*x])^3)/(4*d) + (e*(c + d*x)^2*(a + b*ArcSin[c + d*x])^3)/(2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d}-\frac{(3be)\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d}-\frac{(3be)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}\\
&\quad-\frac{(3b^2e)\,\text{Subst}\left(\int x(a+b\arcsin(x))\,dx,x,c+dx\right)}{2d}\\
&= -\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))}{4d}\\
&\quad+\frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d}-\frac{e(a+b\arcsin(c+dx))^3}{4d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d}+\frac{(3b^3e)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}
\end{aligned}$$

$$= -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}}{8d} - \frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))}{4d} + \frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d} - \frac{e(a+b\arcsin(c+dx))^3}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d} + \frac{(3b^3e)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}}{8d} + \frac{3b^3e\arcsin(c+dx)}{8d} - \frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))}{4d} + \frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d} - \frac{e(a+b\arcsin(c+dx))^3}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.83

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{e\left(\frac{3}{2}b^3\left(-\left((c+dx)\sqrt{1-(c+dx)^2}\right)+\arcsin(c+dx)\right)-3b^2(c+dx)^2(a+b\arcsin(c+dx))+3b(c+dx)}{4d}$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e*((3*b^3*(-((c + d*x)*Sqrt[1 - (c + d*x)^2]) + ArcSin[c + d*x]))/2 - 3*b^
2*(c + d*x)^2*(a + b*ArcSin[c + d*x]) + 3*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]
*(a + b*ArcSin[c + d*x])^2 - (a + b*ArcSin[c + d*x])^3 + 2*(c + d*x)^2*(a +
 b*ArcSin[c + d*x])^3))/(4*d)
```

Maple [A] (verified)

Time = 0.64 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.61

method	result
derivativedivides	$\frac{\frac{e\,a^3(dx+c)^2}{2}+e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c)^2-1\right)\arcsin(dx-}{4}\right.}{}$
default	$\frac{\frac{e\,a^3(dx+c)^2}{2}+e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c)^2-1\right)\arcsin(dx-}{4}\right.}{}$
parts	$e\,a^3\left(\frac{1}{2}d\,x^2+cx\right)+\frac{e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c)^2\right.}{}\right.}{d}$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/2*e*a^3*(d*x+c)^2+e*b^3*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^3+3/4*arcsi
n(d*x+c)^2*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-3/4*((d*x+c)^2-1)*ar
csin(d*x+c)-3/8*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/8*arcsin(d*x+c)-1/2*arcsin(d*
x+c)^3)+3*e*a*b^2*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^2+1/2*arcsin(d*x+c)*((d*
x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-1/4*arcsin(d*x+c)^2-1/4*(d*x+c)^2)+
3*e*a^2*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*x+c)^2)^(1/2)-1/4*
arcsin(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 329 vs. 2(149) = 298.

Time = 0.27 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.99

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{2\,(2\,a^3-3\,ab^2)d^2ex^2+4\,(2\,a^3-3\,ab^2)cdex+2\,(2\,b^3d^2ex^2+4\,b^3cdex+(2\,b^3c^2-b^3)e)\arcsin{(dx+c)}^3+6}{}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(2*a^3 - 3*a*b^2)*d^2*e*x^2 + 4*(2*a^3 - 3*a*b^2)*c*d*e*x + 2*(2*b^3
*d^2*e*x^2 + 4*b^3*c*d*e*x + (2*b^3*c^2 - b^3)*e)*arcsin(d*x + c)^3 + 6*(2*
a*b^2*d^2*e*x^2 + 4*a*b^2*c*d*e*x + (2*a*b^2*c^2 - a*b^2)*e)*arcsin(d*x + c
)^2 + 3*(2*(2*a^2*b - b^3)*d^2*e*x^2 + 4*(2*a^2*b - b^3)*c*d*e*x - (2*a^2*b
 - b^3 - 2*(2*a^2*b - b^3)*c^2)*e)*arcsin(d*x + c) + 3*((2*a^2*b - b^3)*d*e
*x + (2*a^2*b - b^3)*c*e + 2*(b^3*d*e*x + b^3*c*e)*arcsin(d*x + c)^2 + 4*(a
*b^2*d*e*x + a*b^2*c*e)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
)/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 685 vs. $2(148) = 296$.

Time = 0.32 (sec) , antiderivative size = 685, normalized size of antiderivative = 4.15

$$\int (ce + dex)(a + b\arcsin(c + dx))^3 \, dx$$
$$= \begin{cases} a^3cex + \frac{a^3dex^2}{2} + \frac{3a^2bc^2e \operatorname{asin}(c+dx)}{2d} + 3a^2bcex \operatorname{asin}(c + dx) + \frac{3a^2bce\sqrt{-c^2-2cdx-d^2x^2+1}}{4d} + \frac{3a^2bdex^2 \operatorname{asin}(c+dx)}{2} + \\ cex(a + b \operatorname{asin}(c))^3 \end{cases}$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*c*e*x + a**3*d*e*x**2/2 + 3*a**2*b*c**2*e*asin(c + d*x)/(2*
d) + 3*a**2*b*c*e*x*asin(c + d*x) + 3*a**2*b*c*e*sqrt(-c**2 - 2*c*d*x - d**
2*x**2 + 1)/(4*d) + 3*a**2*b*d*e*x**2*asin(c + d*x)/2 + 3*a**2*b*e*x*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/4 - 3*a**2*b*e*asin(c + d*x)/(4*d) + 3*a*b*
*2*c**2*e*asin(c + d*x)**2/(2*d) + 3*a*b**2*c*e*x*asin(c + d*x)**2 - 3*a*b*
*2*c*e*x/2 + 3*a*b**2*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*
x)/(2*d) + 3*a*b**2*d*e*x**2*asin(c + d*x)**2/2 - 3*a*b**2*d*e*x**2/4 + 3*a
*b**2*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/2 - 3*a*b**2*
e*asin(c + d*x)**2/(4*d) + b**3*c**2*e*asin(c + d*x)**3/(2*d) - 3*b**3*c**2
*e*asin(c + d*x)/(4*d) + b**3*c*e*x*asin(c + d*x)**3 - 3*b**3*c*e*x*asin(c
+ d*x)/2 + 3*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**
2/(4*d) - 3*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(8*d) + b**3*d*e
*x**2*asin(c + d*x)**3/2 - 3*b**3*d*e*x**2*asin(c + d*x)/4 + 3*b**3*e*x*sqr
t(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/4 - 3*b**3*e*x*sqrt(-c*
*2 - 2*c*d*x - d**2*x**2 + 1)/8 - b**3*e*asin(c + d*x)**3/(4*d) + 3*b**3*e*
asin(c + d*x)/(8*d), Ne(d, 0)), (c*e*x*(a + b*asin(c))**3, True))
```

Maxima [F]

$$\int (ce + dex)(a + b\arcsin(c + dx))^3 \, dx = \int (dex + ce)(b\arcsin(dx + c) + a)^3 \, dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*d*e*x^2 + 3/4*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*
d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3
- 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^2*b*d*e + a^3*c*e*x + 3*((
d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b*c*e/d + 1/2*(b^3*d
*e*x^2 + 2*b^3*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)
)^3 + integrate(3/2*((b^3*d^2*e*x^2 + 2*b^3*c*d*e*x)*sqrt(d*x + c + 1)*sqrt
```

```
(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2
*(a*b^2*d^3*e*x^3 + 3*a*b^2*c*d^2*e*x^2 + (3*a*b^2*c^2 - a*b^2)*d*e*x + (a*
b^2*c^3 - a*b^2*c)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)
)^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 340 vs. $2(149) = 298$.

Time = 0.34 (sec) , antiderivative size = 340, normalized size of antiderivative = 2.06

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx = \frac{((dx+c)^2-1)b^3e\arcsin(dx+c)^3}{2d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^3e\arcsin(dx+c)^2}{4d} + \frac{3\left((dx+c)^2-1\right)ab^2e\arcsin(dx+c)^2}{2d} + \frac{b^3e\arcsin(dx+c)^3}{4d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^2e\arcsin(dx+c)}{2d} + \frac{3\left((dx+c)^2-1\right)a^2be\arcsin(dx+c)}{2d} - \frac{3\left((dx+c)^2-1\right)b^3e\arcsin(dx+c)}{4d} + \frac{3ab^2e\arcsin(dx+c)^2}{4d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)a^2be}{4d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^3e}{8d} + \frac{((dx+c)^2-1)a^3e}{2d} - \frac{3\left((dx+c)^2-1\right)ab^2e}{4d} + \frac{3a^2be\arcsin(dx+c)}{4d} - \frac{3b^3e\arcsin(dx+c)}{8d} - \frac{3ab^2e}{8d}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*((d*x + c)^2 - 1)*b^3*e*arcsin(d*x + c)^3/d + 3/4*sqrt(-(d*x + c)^2 + 1
)*(d*x + c)*b^3*e*arcsin(d*x + c)^2/d + 3/2*((d*x + c)^2 - 1)*a*b^2*e*arcsi
```

```
n(d*x + c)^2/d + 1/4*b^3*e*arcsin(d*x + c)^3/d + 3/2*sqrt(-(d*x + c)^2 + 1)
*(d*x + c)*a*b^2*e*arcsin(d*x + c)/d + 3/2*((d*x + c)^2 - 1)*a^2*b*e*arcsin
(d*x + c)/d - 3/4*((d*x + c)^2 - 1)*b^3*e*arcsin(d*x + c)/d + 3/4*a*b^2*e*a
rcsin(d*x + c)^2/d + 3/4*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^2*b*e/d - 3/8*s
qrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e/d + 1/2*((d*x + c)^2 - 1)*a^3*e/d - 3
/4*((d*x + c)^2 - 1)*a*b^2*e/d + 3/4*a^2*b*e*arcsin(d*x + c)/d - 3/8*b^3*e*
arcsin(d*x + c)/d - 3/8*a*b^2*e/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce + dex)(a + b\arcsin(c + dx))^3 \, dx = \int (c\,e + d\,e\,x)\,\left(a + b\,\mathrm{asin}(c + d\,x)\right)^3 \, dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^3, x)
```

3.201 $\int (a+b\arcsin(c+dx))^3\,dx$

Optimal result

Integrand size = 12, antiderivative size = 104

$$\int (a+b\arcsin(c+dx))^3\,dx = -6ab^2x-\frac{6b^3\sqrt{1-(c+dx)^2}}{d}-\frac{6b^3(c+dx)\arcsin(c+dx)}{d}+\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^3}{d}$$

```
[Out] -6*a*b^2*x-6*b^3*(d*x+c)*arcsin(d*x+c)/d+(d*x+c)*(a+b*arcsin(d*x+c))^3/d-6*
b^3*(1-(d*x+c)^2)^(1/2)/d+3*b*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4887, 4715, 4767, 267}

$$\int (a+b\arcsin(c+dx))^3\,dx = \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^3}{d}-6ab^2x-\frac{6b^3(c+dx)\arcsin(c+dx)}{d}-\frac{6b^3\sqrt{1-(c+dx)^2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] -6*a*b^2*x - (6*b^3*Sqrt[1 - (c + d*x)^2])/d - (6*b^3*(c + d*x)*ArcSin[c +
d*x])/d + (3*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2)/d + ((c + d
*x)*(a + b*ArcSin[c + d*x])^3)/d
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^3\,dx, x, c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^3}{d} - \frac{(3b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^3}{d}\\
&\quad - \frac{(6b^2)\,\text{Subst}\left(\int (a+b\arcsin(x))\,dx, x, c+dx\right)}{d}\\
&= -6ab^2x + \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^3}{d} - \frac{(6b^3)\,\text{Subst}\left(\int \arcsin(x)\,dx, x, c+dx\right)}{d}\\
&= -6ab^2x - \frac{6b^3(c+dx)\arcsin(c+dx)}{d} + \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{(6b^3)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}
\end{aligned}
$$

$$= -6ab^2x - \frac{6b^3\sqrt{1-(c+dx)^2}}{d} - \frac{6b^3(c+dx)\arcsin(c+dx)}{d} + \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^3}{d}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.92

$$\int (a+b\arcsin(c+dx))^3\,dx = \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2+(c+dx)(a+b\arcsin(c+dx))^3-6b^2\left(a(c+dx)+b\sqrt{1-(c+dx)^2}\right.}{d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (3*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 + (c + d*x)*(a + b*Arc
Sin[c + d*x])^3 - 6*b^2*(a*(c + d*x) + b*Sqrt[1 - (c + d*x)^2] + b*(c + d*x
)*ArcSin[c + d*x]))/d
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.60

method	result
derivativedivides	$\frac{(dx+c)a^3+b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)+3a\,b^2\left(\mathrm{ar}\right.}{d}$
default	$\frac{(dx+c)a^3+b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)+3a\,b^2\left(\mathrm{ar}\right.}{d}$
parts	$x\,a^3+\frac{b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)}{d}+\frac{3a\,b^2\left(a\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*((d*x+c)*a^3+b^3*(arcsin(d*x+c)^3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)^
2)^(1/2)-6*(1-(d*x+c)^2)^(1/2)-6*(d*x+c)*arcsin(d*x+c))+3*a*b^2*(arcsin(d*x
+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+3*a^2*b*((d*x+
c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.52

$$\int (a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{(b^3dx+b^3c)\arcsin\left(dx+c\right)^3+(a^3-6\,ab^2)dx+3\,(ab^2dx+ab^2c)\arcsin\left(dx+c\right)^2+3\,((a^2b-2\,b^3)dx+(c}{}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] ((b^3*d*x + b^3*c)*arcsin(d*x + c)^3 + (a^3 - 6*a*b^2)*d*x + 3*(a*b^2*d*x +
 a*b^2*c)*arcsin(d*x + c)^2 + 3*((a^2*b - 2*b^3)*d*x + (a^2*b - 2*b^3)*c)*a
rcsin(d*x + c) + 3*(b^3*arcsin(d*x + c)^2 + 2*a*b^2*arcsin(d*x + c) + a^2*b
 - 2*b^3)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 282 vs. 2(92) = 184.

Time = 0.19 (sec) , antiderivative size = 282, normalized size of antiderivative = 2.71

$$\int (a+b\arcsin(c+dx))^3\,dx$$
$$= \begin{cases} a^3x+\frac{3a^2bc\,\mathrm{asin}\,(c+dx)}{d}+3a^2bx\,\mathrm{asin}\,(c+dx)+\frac{3a^2b\sqrt{-c^2-2cdx-d^2x^2+1}}{d}+\frac{3ab^2c\,\mathrm{asin}^2\,(c+dx)}{d}+3ab^2x\,\mathrm{asin}^2\,(c+dx \\ x(a+b\,\mathrm{asin}\,(c))^3 \end{cases}$$

```
[In] integrate((a+b*asin(d*x+c))**3,x)
```

```
[Out] Piecewise((a**3*x + 3*a**2*b*c*asin(c + d*x)/d + 3*a**2*b*x*asin(c + d*x) +
 3*a**2*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 3*a*b**2*c*asin(c + d*x
)**2/d + 3*a*b**2*x*asin(c + d*x)**2 - 6*a*b**2*x + 6*a*b**2*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + b**3*c*asin(c + d*x)**3/d - 6*b**
3*c*asin(c + d*x)/d + b**3*x*asin(c + d*x)**3 - 6*b**3*x*asin(c + d*x) + 3*
b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/d - 6*b**3*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d, Ne(d, 0)), (x*(a + b*asin(c))**3, True
))
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^3\,dx = \int (b\arcsin(dx+c)+a)^3\,dx$$

[In] integrate((a+b*arcsin(d*x+c))^3,x, algorithm="maxima")

[Out] b^3*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + a^3*x + 3*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b/d + integrate(3*(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^3*d*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + (a*b^2*d^2*x^2 + 2*a*b^2*c*d*x + a*b^2*c^2 - a*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 208 vs. $2(100) = 200$.

Time = 0.29 (sec) , antiderivative size = 208, normalized size of antiderivative = 2.00

$$\begin{aligned}\int (a+b\arcsin(c+dx))^3\,dx &= \frac{(dx+c)b^3\arcsin(dx+c)^3}{d} + \frac{3\,(dx+c)ab^2\arcsin(dx+c)^2}{d} \\ &\quad + \frac{3\sqrt{-(dx+c)^2+1}b^3\arcsin(dx+c)^2}{d} \\ &\quad + \frac{3\,(dx+c)a^2b\arcsin(dx+c)}{d} - \frac{6\,(dx+c)b^3\arcsin(dx+c)}{d} \\ &\quad + \frac{6\sqrt{-(dx+c)^2+1}ab^2\arcsin(dx+c)}{d} \\ &\quad + \frac{(dx+c)a^3}{d} - \frac{6\,(dx+c)ab^2}{d} \\ &\quad + \frac{3\sqrt{-(dx+c)^2+1}a^2b}{d} - \frac{6\sqrt{-(dx+c)^2+1}b^3}{d}\end{aligned}$$

[In] integrate((a+b*arcsin(d*x+c))^3,x, algorithm="giac")

[Out] (d*x + c)*b^3*arcsin(d*x + c)^3/d + 3*(d*x + c)*a*b^2*arcsin(d*x + c)^2/d + 3*sqrt(-(d*x + c)^2 + 1)*b^3*arcsin(d*x + c)^2/d + 3*(d*x + c)*a^2*b*arcsin(d*x + c)/d - 6*(d*x + c)*b^3*arcsin(d*x + c)/d + 6*sqrt(-(d*x + c)^2 + 1)*a*b^2*arcsin(d*x + c)/d + (d*x + c)*a^3/d - 6*(d*x + c)*a*b^2/d + 3*sqrt(-(d*x + c)^2 + 1)*a^2*b/d - 6*sqrt(-(d*x + c)^2 + 1)*b^3/d

Mupad [B] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.46

$$\int (a+b\arcsin(c+dx))^3\,dx$$
$$= a^3\,x-\frac{b^3\,\left(6\,\mathrm{asin}(c+d\,x)-{\mathrm{asin}(c+d\,x)}^3\right)\,\left(c+d\,x\right)}{d}$$
$$+\frac{3\,a\,b^2\,\left(2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-{\left(c+d\,x\right)}^2}+\left({\mathrm{asin}(c+d\,x)}^2-2\right)\,\left(c+d\,x\right)\right)}{d}$$
$$+\frac{3\,a^2\,b\,\left(\sqrt{1-{\left(c+d\,x\right)}^2}+\mathrm{asin}(c+d\,x)\,\left(c+d\,x\right)\right)}{d}$$
$$+\frac{b^3\,\left(3\,{\mathrm{asin}(c+d\,x)}^2-6\right)\,\sqrt{1-{\left(c+d\,x\right)}^2}}{d}$$

```
[In] int((a + b*asin(c + d*x))^3,x)
```

```
[Out] a^3*x - (b^3*(6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))/d + (3*a*b^2*(2
*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d*x)^2 - 2)*(c + d*x)))/
d + (3*a^2*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*x)*(c + d*x)))/d + (b^3*
(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x)^2)^(1/2))/d
```

3.202 $\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 169

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3b^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{4de}$$

```
[Out] -1/4*I*(a+b*arcsin(d*x+c))^4/b/d/e+(a+b*arcsin(d*x+c))^3*ln(1-(I*(d*x+c)+(1
-(d*x+c)^2)^(1/2))^2)/d/e-3/2*I*b*(a+b*arcsin(d*x+c))^2*polylog(2,(I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3/2*b^2*(a+b*arcsin(d*x+c))*polylog(3,(I*(d*x
+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3/4*I*b^3*polylog(4,(I*(d*x+c)+(1-(d*x+c)^2
)^(1/2))^2)/d/e
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used

= {4889, 12, 4721, 3798, 2221, 2611, 6744, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx = \frac{3b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{2de} - \frac{3ib\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{2de} - \frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3}{de} + \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{4de}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x),x]
```

```
[Out] ((-1/4*I)*(a + b*ArcSin[c + d*x])^4)/(b*d*e) + ((a + b*ArcSin[c + d*x])^3*L
og[1 - E^((2*I)*ArcSin[c + d*x])])/(d*e) - (((3*I)/2)*b*(a + b*ArcSin[c + d
*x])^2*PolyLog[2, E^((2*I)*ArcSin[c + d*x])])/(d*e) + (3*b^2*(a + b*ArcSin[
c + d*x])*PolyLog[3, E^((2*I)*ArcSin[c + d*x])])/(2*d*e) + (((3*I)/4)*b^3*P
olyLog[4, E^((2*I)*ArcSin[c + d*x])])/(d*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
```

```
- 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{ex}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x}\,dx, x, c+dx\right)}{de}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^3\cot(x)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^3}{1-e^{2ix}}\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{(3b)\text{Subst}\left(\int (a+bx)^2\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{(3ib^2)\text{Subst}\left(\int (a+bx)\text{PolyLog}\left(2,e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3b^2(a+b\arcsin(c+dx))\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de} - \frac{(3b^3)\text{Subst}\left(\int \text{PolyLog}\left(3,e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{2de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3b^2(a+b\arcsin(c+dx))\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{(3ib^3)\text{Subst}\left(\int \frac{\text{PolyLog}(3,x)}{x}\,dx, x, e^{2i\arcsin(c+dx)}\right)}{4de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3b^2(a+b\arcsin(c+dx))\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3ib^3\text{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{4de}$$

Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.80

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx = -\frac{i\left(8ab^2\pi^3+b^3\pi^4+96a^2b\arcsin(c+dx)^2-64ab^2\arcsin(c+dx)^3-16b^3\arcsin(c+dx)^4+192iab^2\arcsin\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x),x]
```

```
[Out] ((-1/64*I)*(8*a*b^2*Pi^3 + b^3*Pi^4 + 96*a^2*b*ArcSin[c + d*x]^2 - 64*a*b^2
*ArcSin[c + d*x]^3 - 16*b^3*ArcSin[c + d*x]^4 + (192*I)*a*b^2*ArcSin[c + d*
x]^2*Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (64*I)*b^3*ArcSin[c + d*x]^3*Log
[1 - E^((-2*I)*ArcSin[c + d*x])] + (192*I)*a^2*b*ArcSin[c + d*x]*Log[1 - E^
((2*I)*ArcSin[c + d*x])] + (64*I)*a^3*Log[c + d*x] - 96*b^2*ArcSin[c + d*x]
*(2*a + b*ArcSin[c + d*x])*PolyLog[2, E^((-2*I)*ArcSin[c + d*x])] + 96*a^2*
b*PolyLog[2, E^((2*I)*ArcSin[c + d*x])] + (96*I)*a*b^2*PolyLog[3, E^((-2*I)
*ArcSin[c + d*x])] + (96*I)*b^3*ArcSin[c + d*x]*PolyLog[3, E^((-2*I)*ArcSin
[c + d*x])] + 48*b^3*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])]))/(d*e)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 651 vs. 2(206) = 412.

Time = 0.71 (sec) , antiderivative size = 652, normalized size of antiderivative = 3.86

method	result
derivativedivides	$\frac{\frac{a^3\ln(dx+c)}{e}+\frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c)}\right.\right.}{}}{}$
default	$\frac{\frac{a^3\ln(dx+c)}{e}+\frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c)}\right.\right.}{}}{}$
parts	$\frac{a^3\ln(dx+c)}{ed}+\frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx+\right.\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^3/e*ln(d*x+c)+b^3/e*(-1/4*I*arcsin(d*x+c)^4+arcsin(d*x+c)^3*ln(1-I*(
d*x+c)-(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,I*(d*x+c)+(1-(d*x
+c)^2)^(1/2))+6*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*I*
polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^3*ln(1+I*(d*x+c)+(1-
(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1
/2))+6*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+6*I*polylog(
```

```
4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e*(-1/3*I*arcsin(d*x+c)^3+arcsin
(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,-
I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+
arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polyl
og(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/
2)))+3*a^2*b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x
+c)^2)^(1/2))-I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)*ln(
1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))
))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)/(d*e*x + c*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx =\frac{\int \frac{a^3}{c+dx}\,dx+\int \frac{b^3\operatorname{asin}^3(c+dx)}{c+dx}\,dx+\int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c+dx}\,dx+\int \frac{3a^2b\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e),x)
[Out] (Integral(a**3/(c + d*x), x) + Integral(b**3*asin(c + d*x)**3/(c + d*x), x)
 + Integral(3*a*b**2*asin(c + d*x)**2/(c + d*x), x) + Integral(3*a**2*b*asi
n(c + d*x)/(c + d*x), x))/e
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="maxima")
[Out] a^3*log(d*e*x + c*e)/(d*e) + integrate((b^3*arctan2(d*x + c, sqrt(d*x + c +
 1)*sqrt(-d*x - c + 1))^3 + 3*a*b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1))^2 + 3*a^2*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1)))/(d*e*x + c*e), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x), x)
```

3.203 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 190

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = &-\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)}\\ &-\frac{6b(a+b\arcsin(c+dx))^2\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2}\\ &+\frac{6ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2}\\ &-\frac{6ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2}\\ &-\frac{6b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2}\\ &+\frac{6b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2}\end{aligned}$$

```
[Out] -(a+b*arcsin(d*x+c))^3/d/e^2/(d*x+c)-6*b*(a+b*arcsin(d*x+c))^2*arctanh(I*(d
*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+6*I*b^2*(a+b*arcsin(d*x+c))*polylog(2,-I*(
d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2-6*I*b^2*(a+b*arcsin(d*x+c))*polylog(2,I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-6*b^3*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^
(1/2))/d/e^2+6*b^3*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {4889, 12, 4723, 4803, 4268, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = -\frac{6b\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^2} + \frac{6ib^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^2} - \frac{6ib^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^2} - \frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} - \frac{6b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{6b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c + d*x])^3/(d*e^2*(c + d*x))) - (6*b*(a + b*ArcSin[c + d*x
])^2*ArcTanh[E^(I*ArcSin[c + d*x])])/(d*e^2) + ((6*I)*b^2*(a + b*ArcSin[c +
 d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])])/(d*e^2) - ((6*I)*b^2*(a + b*ArcS
in[c + d*x])*PolyLog[2, E^(I*ArcSin[c + d*x])])/(d*e^2) - (6*b^3*PolyLog[3,
 -E^(I*ArcSin[c + d*x])])/(d*e^2) + (6*b^3*PolyLog[3, E^(I*ArcSin[c + d*x])
])/(d*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{e^2x^2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x^2}\,dx, x, c+dx\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} + \frac{(3b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} + \frac{(3b)\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} - \frac{6b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(6b^2)\,\text{Subst}\left(\int (a+bx)\log\left(1-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} + \frac{(6b^2)\,\text{Subst}\left(\int (a+bx)\log\left(1+e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} - \frac{6b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(6ib^3)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} + \frac{(6ib^3)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} - \frac{6b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(6b^3)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{(6b^3)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(c+dx)}\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} - \frac{6b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{6ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{6b^3\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{6b^3\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2}$$

Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.80

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx =$$

$$-\frac{\frac{a^3}{c+dx}+\frac{3a^2b\arcsin(c+dx)}{c+dx}+\frac{3ab^2\arcsin(c+dx)^2}{c+dx}+\frac{b^3\arcsin(c+dx)^3}{c+dx}-6ab^2\arcsin(c+dx)\log\left(1-e^{i\arcsin(c+dx)}\right)-3b}{}$$

[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^2,x]

[Out] -((a^3/(c + d*x) + (3*a^2*b*ArcSin[c + d*x])/(c + d*x) + (3*a*b^2*ArcSin[c + d*x]^2)/(c + d*x) + (b^3*ArcSin[c + d*x]^3)/(c + d*x) - 6*a*b^2*ArcSin[c + d*x]*Log[1 - E^(I*ArcSin[c + d*x])] - 3*b^3*ArcSin[c + d*x]^2*Log[1 - E^(I*ArcSin[c + d*x])] + 6*a*b^2*ArcSin[c + d*x]*Log[1 + E^(I*ArcSin[c + d*x])] + 3*b^3*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x])] - 3*a^2*b*Log[c + d*x] + 3*a^2*b*Log[1 + Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]] - (6*I)*b^2*(a + b*ArcSin[c + d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])] + (6*I)*b^2*(a + b*ArcSin[c + d*x])*PolyLog[2, E^(I*ArcSin[c + d*x])] + 6*b^3*PolyLog[3, -E^(I*ArcSin[c + d*x])] - 6*b^3*PolyLog[3, E^(I*ArcSin[c + d*x])])/(d*e^2))

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 428, normalized size of antiderivative = 2.25

method	result
derivativedivides	$-\frac{a^3}{e^2(dx+c)}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c}\right.\right.}{}$
default	$-\frac{a^3}{e^2(dx+c)}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c}\right.\right.}{}$
parts	$-\frac{a^3}{e^2(dx+c)d}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\operatorname{polylog}\left(2,i(d\right.\right.}{}$

[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)

[Out] 1/d*(-a^3/e^2/(d*x+c)+b^3/e^2*(-1/(d*x+c)*arcsin(d*x+c)^3+3*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*I*arcsin(d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-3*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*I*arcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e^2*(-arcsin(d*x+c)^2/(d*x+c)+2*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*I*dilog(

```
1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*dilog(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))
)+3*a^2*b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^3}{\left(dex+ce\right)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \frac{\int \frac{a^3}{c^2+2cdx+d^2x^2}\,dx + \int \frac{b^3\operatorname{asin}^3(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{3a^2b\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**2,x)
[Out] (Integral(a**3/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**3*asin(c + d*
x)**3/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(3*a*b**2*asin(c + d*x)**2
/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(3*a**2*b*asin(c + d*x)/(c**2 +
 2*c*d*x + d**2*x**2), x))/e**2
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx=\int \frac{(b\arcsin\left(dx+c\right)+a)^3}{(dex+ce)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^2,x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^2, x)
```

3.204 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 167

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = &-\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3}\\ &-\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)}\\ &-\frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2}\\ &+\frac{3b^2(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3}\\ &-\frac{3ib^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de^3}\end{aligned}$$

```
[Out] -3/2*I*b*(a+b*arcsin(d*x+c))^2/d/e^3-1/2*(a+b*arcsin(d*x+c))^3/d/e^3/(d*x+c
)^2+3*b^2*(a+b*arcsin(d*x+c))*ln(1-(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3
-3/2*I*b^3*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3-3/2*b*(a+b*ar
csin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used

= {4889, 12, 4723, 4771, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \frac{3b^2\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^3} - \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{3ib(a+b\arcsin(c+dx))^2}{2de^3} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} - \frac{3ib^3\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de^3}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^3,x]
```

```
[Out] (((-3*I)/2)*b*(a + b*ArcSin[c + d*x])^2)/(d*e^3) - (3*b*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2)/(2*d*e^3*(c + d*x)) - (a + b*ArcSin[c + d*x])
^3/(2*d*e^3*(c + d*x)^2) + (3*b^2*(a + b*ArcSin[c + d*x])*Log[1 - E^((2*I)*
ArcSin[c + d*x])])/(d*e^3) - (((3*I)/2)*b^3*PolyLog[2, E^((2*I)*ArcSin[c +
d*x])])/(d*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{e^3x^3}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x^3}\,dx, x, c+dx\right)}{de^3}\\
&= -\frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2}+\frac{(3b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^2\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2de^3}\\
&= -\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)}\\
&\quad -\frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2}+\frac{(3b^2)\,\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x}\,dx, x, c+dx\right)}{de^3}
\end{aligned}
$$

$$= -\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} + \frac{(3b^2)\,\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(c+dx)\right)}{de^3}$$

$$= -\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3} - \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} - \frac{(6ib^2)\,\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(c+dx)\right)}{de^3}$$

$$= -\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3} - \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} + \frac{3b^2(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{(3b^3)\,\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^3}$$

$$= -\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3} - \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} + \frac{3b^2(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} + \frac{(3ib^3)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(c+dx)}\right)}{2de^3}$$

$$= -\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3} - \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2} + \frac{3b^2(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{3ib^3\,\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{2de^3}$$

Mathematica [A] (verified)

Time = 1.15 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.49

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = -\frac{3b^2\left(a+b(c+dx)\left(ic+idx+\sqrt{1-c^2-2cdx-d^2x^2}\right)\right)\arcsin(c+dx)^2+b^3\arcsin(c+dx)^3+3b\,\text{arcsi}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^3,x]
```

```
[Out] -1/2*(3*b^2*(a + b*(c + d*x)*(I*c + I*d*x + Sqrt[1 - c^2 - 2*c*d*x - d^2*x^
2]))*ArcSin[c + d*x]^2 + b^3*ArcSin[c + d*x]^3 + 3*b*ArcSin[c + d*x]*(a*(a
```

```
+ 2*b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]) - 2*b^2*(c + d*x)^2*Log[
1 - E^((2*I)*ArcSin[c + d*x])]) + a*(a*(a + 3*b*(c + d*x)*Sqrt[1 - c^2 - 2*
c*d*x - d^2*x^2]) - 6*b^2*(c + d*x)^2*Log[c + d*x]) + (3*I)*b^3*(c + d*x)^2
*PolyLog[2, E^((2*I)*ArcSin[c + d*x])])/(d*e^3*(c + d*x)^2)
```

Maple [A] (verified)

Time = 0.91 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.94

method	result
derivativedivides	$-\frac{a^3}{2e^3(dx+c)^2}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c}\right.\right.}{}$
default	$-\frac{a^3}{2e^3(dx+c)^2}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c}\right.\right.}{}$
parts	$-\frac{a^3}{2e^3(dx+c)^2d}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)-\right.\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/2*a^3/e^3/(d*x+c)^2+b^3/e^3*(-1/2*arcsin(d*x+c)^2*(-3*I*(d*x+c)^2+3
*(d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2+3*arcsin(d*x+c)*ln(1-
I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)
^(1/2))-3*I*arcsin(d*x+c)^2-3*I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-3*
I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e^3*(-1/2*arcsin(d*x+c
)^2/(d*x+c)^2-arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+3*a^2*b/
e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^3}{\left(dex+ce\right)^3}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)
, x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \frac{\int \frac{a^3}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{b^3\operatorname{asin}^3(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3a^2b\operatorname{asin}(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**3,x)
[Out] (Integral(a**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(b**3*asin(c + d*x)**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x
) + Integral(3*a*b**2*asin(c + d*x)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 +
 d**3*x**3), x) + Integral(3*a**2*b*asin(c + d*x)/(c**3 + 3*c**2*d*x + 3*c*
d**2*x**2 + d**3*x**3), x))/e**3
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="maxima")
[Out] Timed out
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^3}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^3}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^3,x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^3, x)
```

3.205 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4} dx$

Optimal result

Integrand size = 23, antiderivative size = 291

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx =& -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} \\ &- \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} \\ &- \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} \\ &- \frac{b(a+b\arcsin(c+dx))^2\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} \\ &- \frac{b^3\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^4} \\ &+ \frac{ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &- \frac{ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} \\ &- \frac{b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &+ \frac{b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4}\end{aligned}$$

```
[Out] -b^2*(a+b*arcsin(d*x+c))/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^3/d/e^4/(d*x
+c)^3-b*(a+b*arcsin(d*x+c))^2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-
b^3*arctanh((1-(d*x+c)^2)^(1/2))/d/e^4+I*b^2*(a+b*arcsin(d*x+c))*polylog(2,
-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-I*b^2*(a+b*arcsin(d*x+c))*polylog(2,I
*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-b^3*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^
(1/2))/d/e^4+b^3*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-1/2*b*(a+b*
arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)^2
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4889, 12, 4723, 4789, 4803, 4268, 2611, 2320, 6724, 272, 65, 212}

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = -\frac{b\,\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^4} + \frac{ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^4} - \frac{ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^4} - \frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} - \frac{b^3\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{b^3\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^3\,\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^4}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^4,x]
```

```
[Out] -((b^2*(a + b*ArcSin[c + d*x]))/(d*e^4*(c + d*x))) - (b*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2)/(2*d*e^4*(c + d*x)^2) - (a + b*ArcSin[c + d*x
])^3/(3*d*e^4*(c + d*x)^3) - (b*(a + b*ArcSin[c + d*x])^2*ArcTanh[E^(I*ArcS
in[c + d*x])])/(d*e^4) - (b^3*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(d*e^4) + (I*
b^2*(a + b*ArcSin[c + d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])])/(d*e^4) - (
I*b^2*(a + b*ArcSin[c + d*x])*PolyLog[2, E^(I*ArcSin[c + d*x])])/(d*e^4) -
(b^3*PolyLog[3, -E^(I*ArcSin[c + d*x])])/(d*e^4) + (b^3*PolyLog[3, E^(I*Arc
Sin[c + d*x])])/(d*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{e^4x^4}\,dx,x,c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x^4}\,dx,x,c+dx\right)}{de^4}\\
&= -\frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3}+\frac{b\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^3\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de^4}\\
&= -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2}-\frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3}\\
&\quad+\frac{b\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2de^4}+\frac{b^2\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x^2}\,dx,x,c+dx\right)}{de^4}
\end{aligned}$$

$$= -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} + \frac{b\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx,x,\arcsin(c+dx)\right)}{2de^4} + \frac{b^3\text{Subst}\left(\int \frac{1}{x\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de^4}$$

$$= -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} - \frac{b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^2\text{Subst}\left(\int (a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} + \frac{b^2\text{Subst}\left(\int (a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} + \frac{b^3\text{Subst}\left(\int \frac{1}{\sqrt{1-x}x}\,dx,x,(c+dx)^2\right)}{2de^4}$$

$$= -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} - \frac{b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{(ib^3)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} + \frac{(ib^3)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} - \frac{b^3\text{Subst}\left(\int \frac{1}{1-x^2}\,dx,x,\sqrt{1-(c+dx)^2}\right)}{de^4}$$

$$= -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} - \frac{b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^3\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^4} + \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^3\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{b^3\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^4}$$

$$= -\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3} - \frac{b(a+b\arcsin(c+dx))^2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^3\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^4} + \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{ib^2(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{b^3\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{b^3\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 732 vs. 2(291) = 582.

Time = 8.26 (sec) , antiderivative size = 732, normalized size of antiderivative = 2.52

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = -\frac{a^3}{3de^4(c+dx)^3} - \frac{a^2b\sqrt{1-c^2-2cdx-d^2x^2}}{2de^4(c+dx)^2} - \frac{a^2b\arcsin(c+dx)}{de^4(c+dx)^3} + \frac{a^2b\log(c+dx)}{2de^4} - \frac{a^2b\log\left(1+\sqrt{1-c^2-2cdx-d^2x^2}\right)}{2de^4} + \frac{ab^2\left(8i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right) - \frac{2(2+4\arcsin(c+dx)^2-2\cos(2\arcsin(c+dx))-3(c+dx)\arcsin(c+dx)\log(1-e^{i\arcsin(c+dx)})}{}\right.}{} + \frac{b^3\left(-24\arcsin(c+dx)\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 4\arcsin(c+dx)^3\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 6\arcsin(c+\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^4,x]
```

```
[Out] -1/3*a^3/(d*e^4*(c + d*x)^3) - (a^2*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/(2
*d*e^4*(c + d*x)^2) - (a^2*b*ArcSin[c + d*x])/(d*e^4*(c + d*x)^3) + (a^2*b*
Log[c + d*x])/(2*d*e^4) - (a^2*b*Log[1 + Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]]
)/(2*d*e^4) + (a*b^2*((8*I)*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (2*(2 + 4*
ArcSin[c + d*x]^2 - 2*Cos[2*ArcSin[c + d*x]] - 3*(c + d*x)*ArcSin[c + d*x]*
Log[1 - E^(I*ArcSin[c + d*x])] + 3*(c + d*x)*ArcSin[c + d*x]*Log[1 + E^(I*A
rcSin[c + d*x])] + (4*I)*(c + d*x)^3*PolyLog[2, E^(I*ArcSin[c + d*x])] + 2*
ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] + ArcSin[c + d*x]*Log[1 - E^(I*ArcSi
n[c + d*x])]*Sin[3*ArcSin[c + d*x]] - ArcSin[c + d*x]*Log[1 + E^(I*ArcSin[c
 + d*x])]*Sin[3*ArcSin[c + d*x]]))/(c + d*x)^3))/(8*d*e^4) + (b^3*(-24*ArcS
in[c + d*x]*Cot[ArcSin[c + d*x]/2] - 4*ArcSin[c + d*x]^3*Cot[ArcSin[c + d*x
]/2] - 6*ArcSin[c + d*x]^2*Csc[ArcSin[c + d*x]/2]^2 - (c + d*x)*ArcSin[c +
d*x]^3*Csc[ArcSin[c + d*x]/2]^4 + 24*ArcSin[c + d*x]^2*Log[1 - E^(I*ArcSin[
c + d*x])] - 24*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x])] + 48*Log[T
an[ArcSin[c + d*x]/2]] + (48*I)*ArcSin[c + d*x]*PolyLog[2, -E^(I*ArcSin[c +
 d*x])] - (48*I)*ArcSin[c + d*x]*PolyLog[2, E^(I*ArcSin[c + d*x])] - 48*Pol
yLog[3, -E^(I*ArcSin[c + d*x])] + 48*PolyLog[3, E^(I*ArcSin[c + d*x])] + 6*
ArcSin[c + d*x]^2*Sec[ArcSin[c + d*x]/2]^2 - (16*ArcSin[c + d*x]^3*Sin[ArcS
in[c + d*x]/2]^4)/(c + d*x)^3 - 24*ArcSin[c + d*x]*Tan[ArcSin[c + d*x]/2] -
 4*ArcSin[c + d*x]^3*Tan[ArcSin[c + d*x]/2]))/(48*d*e^4)
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 550, normalized size of antiderivative = 1.89

method	result
derivativedivides	$-\frac{a^3}{3e^4(dx+c)^3}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\frac{\arcsin(dx+c)^2\ln\left(1-i(dx+c)\right.}{2}\right.}{}$
default	$-\frac{a^3}{3e^4(dx+c)^3}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\frac{\arcsin(dx+c)^2\ln\left(1-i(dx+c)\right.}{2}\right.}{}$
parts	$-\frac{a^3}{3e^4(dx+c)^3d}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\frac{\arcsin(dx+c)^2\ln\left(1-i(\right.}{}\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3*a^3/e^4/(d*x+c)^3+b^3/e^4*(-1/6/(d*x+c)^3*arcsin(d*x+c)*(3*arcsin
(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+2*arcsin(d*x+c)^2+6*(d*x+c)^2)+1/2*arcs
in(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*arcsin(d*x+c)*polylog(2,I
*(d*x+c)+(1-(d*x+c)^2)^(1/2))+polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-1/2*
arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+I*arcsin(d*x+c)*polylog
(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)
)-2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e^4*(-1/3*(arcsin(d*x+c
)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+(d*x+c)^2)/(d*x+c)^3+1/3*arcs
in(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3*I*polylog(2,I*(d*x+c)+(1-
(d*x+c)^2)^(1/2))-1/3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+1/3
*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a^2*b/e^4*(-1/3/(d*x+c)^3*a
rcsin(d*x+c)-1/6/(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x+c)^2)^
(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="fricas")
```

```
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)/(d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^
3*d*e^4*x + c^4*e^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \frac{\int \frac{a^3}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b^3\,\mathrm{asin}^3\,(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{3ab^2\,\mathrm{asin}^2\,(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{}{c}}{e^4}$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**4,x)
```

```
[Out] (Integral(a**3/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4
*x**4), x) + Integral(b**3*asin(c + d*x)**3/(c**4 + 4*c**3*d*x + 6*c**2*d**
2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(3*a*b**2*asin(c + d*x)**
2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) +
Integral(3*a**2*b*asin(c + d*x)/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c
*d**3*x**3 + d**4*x**4), x))/e**4
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^3/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1/
3*(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 3*(d^4*e^
4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(((b^3*d*x
+ b^3*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c
 + 1)*sqrt(-d*x - c + 1))^2 - 3*(a*b^2*d^2*x^2 + 2*a*b^2*c*d*x + a*b^2*c^2
- a*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 - 3*(a^2*
b*d^2*x^2 + 2*a^2*b*c*d*x + a^2*b*c^2 - a^2*b)*arctan2(d*x + c, sqrt(d*x +
c + 1)*sqrt(-d*x - c + 1)))/(d^6*e^4*x^6 + 6*c*d^5*e^4*x^5 + (15*c^2 - 1)*d
^4*e^4*x^4 + 4*(5*c^3 - c)*d^3*e^4*x^3 + 3*(5*c^4 - 2*c^2)*d^2*e^4*x^2 + 2*
(3*c^5 - 2*c^3)*d*e^4*x + (c^6 - c^4)*e^4), x))/(d^4*e^4*x^3 + 3*c*d^3*e^4*
x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin{(dx+c)}+a)^3}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^4}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^4,x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^4, x)
```

3.206 $\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 23, antiderivative size = 357

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx &= \frac{45b^4e^3(c+dx)^2}{128d}+\frac{3b^4e^3(c+dx)^4}{128d}-\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{64d}\\
&-\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d}+\frac{45b^2e^3(a+b\arcsin(c+dx))^2}{128d}\\
&-\frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d}-\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d}\\
&+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d}\\
&+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d}\\
&-\frac{3e^3(a+b\arcsin(c+dx))^4}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d}\end{aligned}$$

```
[Out] 45/128*b^4*e^3*(d*x+c)^2/d+3/128*b^4*e^3*(d*x+c)^4/d+45/128*b^2*e^3*(a+b*ar
csin(d*x+c))^2/d-9/16*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))^2/d-3/16*b^2*e^
3*(d*x+c)^4*(a+b*arcsin(d*x+c))^2/d-3/32*e^3*(a+b*arcsin(d*x+c))^4/d+1/4*e^
3*(d*x+c)^4*(a+b*arcsin(d*x+c))^4/d-45/64*b^3*e^3*(d*x+c)*(a+b*arcsin(d*x+c
))*(1-(d*x+c)^2)^(1/2)/d-3/32*b^3*e^3*(d*x+c)^3*(a+b*arcsin(d*x+c))*(1-(d*x
+c)^2)^(1/2)/d+3/8*b*e^3*(d*x+c)*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/
d+1/4*b*e^3*(d*x+c)^3*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 12, 4723, 4795, 4737, 30}

$$\begin{aligned}
&\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx \\
&= -\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d} \\
&\quad -\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{64d} \\
&\quad -\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d} \\
&\quad +\frac{45b^2e^3(a+b\arcsin(c+dx))^2}{128d}-\frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d} \\
&\quad +\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} \\
&\quad +\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d} \\
&\quad +\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d} \\
&\quad -\frac{3e^3(a+b\arcsin(c+dx))^4}{32d}+\frac{3b^4e^3(c+dx)^4}{128d}+\frac{45b^4e^3(c+dx)^2}{128d}
\end{aligned}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (45*b^4*e^3*(c + d*x)^2)/(128*d) + (3*b^4*e^3*(c + d*x)^4)/(128*d) - (45*b^
3*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(64*d) - (3*
b^3*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(32*d) +
 (45*b^2*e^3*(a + b*ArcSin[c + d*x])^2)/(128*d) - (9*b^2*e^3*(c + d*x)^2*(a
 + b*ArcSin[c + d*x])^2)/(16*d) - (3*b^2*e^3*(c + d*x)^4*(a + b*ArcSin[c +
d*x])^2)/(16*d) + (3*b*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c
+ d*x])^3)/(8*d) + (b*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c
 + d*x])^3)/(4*d) - (3*e^3*(a + b*ArcSin[c + d*x])^4)/(32*d) + (e^3*(c + d*
x)^4*(a + b*ArcSin[c + d*x])^4)/(4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}\\ &= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}\\ &= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d}-\frac{(be^3)\,\text{Subst}\left(\int\frac{x^4(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}\end{aligned}$$

$$= \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d} - \frac{(3be^3)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{4d} - \frac{(3b^2e^3)\,\text{Subst}\left(\int x^3(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{4d}$$

$$= -\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d} + \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d} - \frac{(3be^3)\,\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d} - \frac{(9b^2e^3)\,\text{Subst}\left(\int x(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{8d} + \frac{(3b^3e^3)\,\text{Subst}\left(\int \frac{x^4(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d} - \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d} + \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} - \frac{3e^3(a+b\arcsin(c+dx))^4}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d} + \frac{(9b^3e^3)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{32d} + \frac{(9b^3e^3)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d} + \frac{(3b^4e^3)\,\text{Subst}\left(\int x^3\,dx, x, c+dx\right)}{32d}$$

$$
\begin{aligned}
&= \frac{3b^4e^3(c+dx)^4}{128d} - \frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{64d} \\
&\quad - \frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d} \\
&\quad - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d} - \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d} \\
&\quad + \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d} \\
&\quad + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} - \frac{3e^3(a+b\arcsin(c+dx))^4}{32d} \\
&\quad + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d} + \frac{(9b^3e^3)\operatorname{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{64d} \\
&\quad + \frac{(9b^3e^3)\operatorname{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{16d} \\
&\quad + \frac{(9b^4e^3)\operatorname{Subst}(\int x\,dx, x, c+dx)}{64d} + \frac{(9b^4e^3)\operatorname{Subst}(\int x\,dx, x, c+dx)}{16d}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{45b^4e^3(c+dx)^2}{128d} + \frac{3b^4e^3(c+dx)^4}{128d} \\
&\quad - \frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{64d} \\
&\quad - \frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d} \\
&\quad + \frac{45b^2e^3(a+b\arcsin(c+dx))^2}{128d} - \frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d} \\
&\quad - \frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d} \\
&\quad + \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d} \\
&\quad + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d} \\
&\quad - \frac{3e^3(a+b\arcsin(c+dx))^4}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.80

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$$
$$=\frac{e^3\left(\frac{45}{4}b^4(c+dx)^2+\frac{3}{4}b^4(c+dx)^4-\frac{45}{2}b^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))-3b^3(c+dx)^3\sqrt{1-\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e^3*((45*b^4*(c + d*x)^2)/4 + (3*b^4*(c + d*x)^4)/4 - (45*b^3*(c + d*x)*Sq
rt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 - 3*b^3*(c + d*x)^3*Sqrt[1 -
 (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (45*b^2*(a + b*ArcSin[c + d*x])^2)/
4 - 18*b^2*(c + d*x)^2*(a + b*ArcSin[c + d*x])^2 - 6*b^2*(c + d*x)^4*(a + b
*ArcSin[c + d*x])^2 + 12*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c
+ d*x])^3 + 8*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3
 - 3*(a + b*ArcSin[c + d*x])^4 + 8*(c + d*x)^4*(a + b*ArcSin[c + d*x])^4))/
(32*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 656 vs. 2(327) = 654.

Time = 1.38 (sec) , antiderivative size = 657, normalized size of antiderivative = 1.84

method	result
derivativedivides	$\frac{\frac{e^3a^4(dx+c)^4}{4}+e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{8}-\right.}{}$
default	$\frac{\frac{e^3a^4(dx+c)^4}{4}+e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{8}-\right.}{}$
parts	$\frac{e^3a^4(dx+c)^4}{4d}+\frac{e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{8}\right.}{}$

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/4*e^3*a^4*(d*x+c)^4+e^3*b^4*(1/4*(d*x+c)^4*arcsin(d*x+c)^4-1/8*arcsi
n(d*x+c)^3*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+
3*arcsin(d*x+c))-3/16*(d*x+c)^4*arcsin(d*x+c)^2+3/64*arcsin(d*x+c)*(-2*(d*x
+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c))+27
/128*arcsin(d*x+c)^2+3/512*(2*(d*x+c)^2+3)^2-9/16*((d*x+c)^2-1)*arcsin(d*x+
c)^2-9/16*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))+9/32*(d
*x+c)^2+9/32*arcsin(d*x+c)^4)+4*e^3*a*b^3*(1/4*(d*x+c)^4*arcsin(d*x+c)^3-3/
```

```
32*arcsin(d*x+c)^2*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2
)^(1/2)+3*arcsin(d*x+c))-3/32*(d*x+c)^4*arcsin(d*x+c)-3/256*(d*x+c)*(2*(d*x
+c)^2+3)*(1-(d*x+c)^2)^(1/2)-27/256*arcsin(d*x+c)-9/32*((d*x+c)^2-1)*arcsin
(d*x+c)-9/64*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3/16*arcsin(d*x+c)^3)+6*e^3*a^2*b^
2*(1/4*(d*x+c)^4*arcsin(d*x+c)^2-1/16*arcsin(d*x+c)*(-2*(d*x+c)^3*(1-(d*x+c
)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c))+3/32*arcsin(d*x+c
)^2-1/128*(2*(d*x+c)^2+3)^2)+4*e^3*a^3*b*(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*
(d*x+c)^3*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(
d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1148 vs. $2(327) = 654$.

Time = 0.30 (sec) , antiderivative size = 1148, normalized size of antiderivative = 3.22

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/128*((32*a^4 - 24*a^2*b^2 + 3*b^4)*d^4*e^3*x^4 + 4*(32*a^4 - 24*a^2*b^2 +
 3*b^4)*c*d^3*e^3*x^3 - 3*(24*a^2*b^2 - 15*b^4 - 2*(32*a^4 - 24*a^2*b^2 + 3
*b^4)*c^2)*d^2*e^3*x^2 + 2*(2*(32*a^4 - 24*a^2*b^2 + 3*b^4)*c^3 - 9*(8*a^2*
b^2 - 5*b^4)*c)*d*e^3*x + 4*(8*b^4*d^4*e^3*x^4 + 32*b^4*c*d^3*e^3*x^3 + 48*
b^4*c^2*d^2*e^3*x^2 + 32*b^4*c^3*d*e^3*x + (8*b^4*c^4 - 3*b^4)*e^3)*arcsin(
d*x + c)^4 + 16*(8*a*b^3*d^4*e^3*x^4 + 32*a*b^3*c*d^3*e^3*x^3 + 48*a*b^3*c^
2*d^2*e^3*x^2 + 32*a*b^3*c^3*d*e^3*x + (8*a*b^3*c^4 - 3*a*b^3)*e^3)*arcsin(
d*x + c)^3 + 3*(8*(8*a^2*b^2 - b^4)*d^4*e^3*x^4 + 32*(8*a^2*b^2 - b^4)*c*d^
3*e^3*x^3 - 24*(b^4 - 2*(8*a^2*b^2 - b^4)*c^2)*d^2*e^3*x^2 - 16*(3*b^4*c -
2*(8*a^2*b^2 - b^4)*c^3)*d*e^3*x - (24*b^4*c^2 - 8*(8*a^2*b^2 - b^4)*c^4 +
24*a^2*b^2 - 15*b^4)*e^3)*arcsin(d*x + c)^2 + 2*(8*(8*a^3*b - 3*a*b^3)*d^4*
e^3*x^4 + 32*(8*a^3*b - 3*a*b^3)*c*d^3*e^3*x^3 - 24*(3*a*b^3 - 2*(8*a^3*b -
 3*a*b^3)*c^2)*d^2*e^3*x^2 - 16*(9*a*b^3*c - 2*(8*a^3*b - 3*a*b^3)*c^3)*d*e
^3*x - (72*a*b^3*c^2 - 8*(8*a^3*b - 3*a*b^3)*c^4 + 24*a^3*b - 45*a*b^3)*e^3
)*arcsin(d*x + c) + 2*(2*(8*a^3*b - 3*a*b^3)*d^3*e^3*x^3 + 6*(8*a^3*b - 3*a
*b^3)*c*d^2*e^3*x^2 + 3*(8*a^3*b - 15*a*b^3 + 2*(8*a^3*b - 3*a*b^3)*c^2)*d*
e^3*x + (2*(8*a^3*b - 3*a*b^3)*c^3 + 3*(8*a^3*b - 15*a*b^3)*c)*e^3 + 8*(2*b
^4*d^3*e^3*x^3 + 6*b^4*c*d^2*e^3*x^2 + 3*(2*b^4*c^2 + b^4)*d*e^3*x + (2*b^4
*c^3 + 3*b^4*c)*e^3)*arcsin(d*x + c)^3 + 24*(2*a*b^3*d^3*e^3*x^3 + 6*a*b^3*
c*d^2*e^3*x^2 + 3*(2*a*b^3*c^2 + a*b^3)*d*e^3*x + (2*a*b^3*c^3 + 3*a*b^3*c)
*e^3)*arcsin(d*x + c)^2 + 3*(2*(8*a^2*b^2 - b^4)*d^3*e^3*x^3 + 6*(8*a^2*b^2
 - b^4)*c*d^2*e^3*x^2 + 3*(8*a^2*b^2 - 5*b^4 + 2*(8*a^2*b^2 - b^4)*c^2)*d*e
^3*x + (2*(8*a^2*b^2 - b^4)*c^3 + 3*(8*a^2*b^2 - 5*b^4)*c)*e^3)*arcsin(d*x
+ c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2876 vs. $2(325) = 650$.

Time = 1.21 (sec) , antiderivative size = 2876, normalized size of antiderivative = 8.06

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*c**3*e**3*x + 3*a**4*c**2*d*e**3*x**2/2 + a**4*c*d**2*e**3*
x**3 + a**4*d**3*e**3*x**4/4 + a**3*b*c**4*e**3*asin(c + d*x)/d + 4*a**3*b*
c**3*e**3*x*asin(c + d*x) + a**3*b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x*
*2 + 1)/(4*d) + 6*a**3*b*c**2*d*e**3*x**2*asin(c + d*x) + 3*a**3*b*c**2*e**
3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4 + 4*a**3*b*c*d**2*e**3*x**3*asi
n(c + d*x) + 3*a**3*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4
 + 3*a**3*b*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(8*d) + a**3*b*d**
3*e**3*x**4*asin(c + d*x) + a**3*b*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)/4 + 3*a**3*b*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 -
3*a**3*b*e**3*asin(c + d*x)/(8*d) + 3*a**2*b**2*c**4*e**3*asin(c + d*x)**2/
(2*d) + 6*a**2*b**2*c**3*e**3*x*asin(c + d*x)**2 - 3*a**2*b**2*c**3*e**3*x/
4 + 3*a**2*b**2*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*
x)/(4*d) + 9*a**2*b**2*c**2*d*e**3*x**2*asin(c + d*x)**2 - 9*a**2*b**2*c**2
*d*e**3*x**2/8 + 9*a**2*b**2*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
 1)*asin(c + d*x)/4 + 6*a**2*b**2*c*d**2*e**3*x**3*asin(c + d*x)**2 - 3*a**
2*b**2*c*d**2*e**3*x**3/4 + 9*a**2*b**2*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)*asin(c + d*x)/4 - 9*a**2*b**2*c*e**3*x/8 + 9*a**2*b**2*c*e
**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(8*d) + 3*a**2*b**2
*d**3*e**3*x**4*asin(c + d*x)**2/2 - 3*a**2*b**2*d**3*e**3*x**4/16 + 3*a**2
*b**2*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/4
- 9*a**2*b**2*d*e**3*x**2/16 + 9*a**2*b**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)*asin(c + d*x)/8 - 9*a**2*b**2*e**3*asin(c + d*x)**2/(16*d) + a
*b**3*c**4*e**3*asin(c + d*x)**3/d - 3*a*b**3*c**4*e**3*asin(c + d*x)/(8*d)
 + 4*a*b**3*c**3*e**3*x*asin(c + d*x)**3 - 3*a*b**3*c**3*e**3*x*asin(c + d*
x)/2 + 3*a*b**3*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*
x)**2/(4*d) - 3*a*b**3*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(32*
d) + 6*a*b**3*c**2*d*e**3*x**2*asin(c + d*x)**3 - 9*a*b**3*c**2*d*e**3*x**2
*asin(c + d*x)/4 + 9*a*b**3*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
1)*asin(c + d*x)**2/4 - 9*a*b**3*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x*
*2 + 1)/32 - 9*a*b**3*c**2*e**3*asin(c + d*x)/(8*d) + 4*a*b**3*c*d**2*e**3*
x**3*asin(c + d*x)**3 - 3*a*b**3*c*d**2*e**3*x**3*asin(c + d*x)/2 + 9*a*b**
3*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/4 -
9*a*b**3*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/32 - 9*a*b**3*
c*e**3*x*asin(c + d*x)/4 + 9*a*b**3*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)*asin(c + d*x)**2/(8*d) - 45*a*b**3*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2
```

```
*x**2 + 1)/(64*d) + a*b**3*d**3*e**3*x**4*asin(c + d*x)**3 - 3*a*b**3*d**3*
e**3*x**4*asin(c + d*x)/8 + 3*a*b**3*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x -
d**2*x**2 + 1)*asin(c + d*x)**2/4 - 3*a*b**3*d**2*e**3*x**3*sqrt(-c**2 - 2*
c*d*x - d**2*x**2 + 1)/32 - 9*a*b**3*d*e**3*x**2*asin(c + d*x)/8 + 9*a*b**3
*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/8 - 45*a*b**
3*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/64 - 3*a*b**3*e**3*asin(c +
d*x)**3/(8*d) + 45*a*b**3*e**3*asin(c + d*x)/(64*d) + b**4*c**4*e**3*asin(c
 + d*x)**4/(4*d) - 3*b**4*c**4*e**3*asin(c + d*x)**2/(16*d) + b**4*c**3*e**
3*x*asin(c + d*x)**4 - 3*b**4*c**3*e**3*x*asin(c + d*x)**2/4 + 3*b**4*c**3*
e**3*x/32 + b**4*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d
*x)**3/(4*d) - 3*b**4*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(
c + d*x)/(32*d) + 3*b**4*c**2*d*e**3*x**2*asin(c + d*x)**4/2 - 9*b**4*c**2*
d*e**3*x**2*asin(c + d*x)**2/8 + 9*b**4*c**2*d*e**3*x**2/64 + 3*b**4*c**2*e
**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/4 - 9*b**4*c**
2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/32 - 9*b**4*c*
*2*e**3*asin(c + d*x)**2/(16*d) + b**4*c*d**2*e**3*x**3*asin(c + d*x)**4 -
3*b**4*c*d**2*e**3*x**3*asin(c + d*x)**2/4 + 3*b**4*c*d**2*e**3*x**3/32 + 3
*b**4*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/
4 - 9*b**4*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x
)/32 - 9*b**4*c*e**3*x*asin(c + d*x)**2/8 + 45*b**4*c*e**3*x/64 + 3*b**4*c*
e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/(8*d) - 45*b**4
*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(64*d) + b**4*d
**3*e**3*x**4*asin(c + d*x)**4/4 - 3*b**4*d**3*e**3*x**4*asin(c + d*x)**2/1
6 + 3*b**4*d**3*e**3*x**4/128 + b**4*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x -
d**2*x**2 + 1)*asin(c + d*x)**3/4 - 3*b**4*d**2*e**3*x**3*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)*asin(c + d*x)/32 - 9*b**4*d*e**3*x**2*asin(c + d*x)**2
/16 + 45*b**4*d*e**3*x**2/128 + 3*b**4*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x
**2 + 1)*asin(c + d*x)**3/8 - 45*b**4*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x*
*2 + 1)*asin(c + d*x)/64 - 3*b**4*e**3*asin(c + d*x)**4/(32*d) + 45*b**4*e*
*3*asin(c + d*x)**2/(128*d), Ne(d, 0)), (c**3*e**3*x*(a + b*asin(c))**4, Tr
ue))
```

Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx=\int (dex+ce)^3(b\arcsin(dx+c)+a)^4\,dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/4*a^4*d^3*e^3*x^4 + a^4*c*d^2*e^3*x^3 + 3/2*a^4*c^2*d*e^3*x^2 + 3*(2*x^2*
arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d
^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^
2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x -
 c^2 + 1)*c/d^3))*a^3*b*c^2*d*e^3 + 2/3*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(
```

```
-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c
^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3
 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 +
 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*(c^2 - 1)/d^4))*a^3*b*c*d^2*e^3 + 1/24*(24*x^4*arcsin(d*x + c) +
 (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 -
 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*(c^2 -
 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 105*sqrt
(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^
2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)*d
)*a^3*b*d^3*e^3 + a^4*c^3*e^3*x + 4*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x
 + c)^2 + 1))*a^3*b*c^3*e^3/d + 1/4*(b^4*d^3*e^3*x^4 + 4*b^4*c*d^2*e^3*x^3
+ 6*b^4*c^2*d*e^3*x^2 + 4*b^4*c^3*e^3*x)*arctan2(d*x + c, sqrt(d*x + c + 1)
*sqrt(-d*x - c + 1))^4 + integrate(((b^4*d^4*e^3*x^4 + 4*b^4*c*d^3*e^3*x^3
+ 6*b^4*c^2*d^2*e^3*x^2 + 4*b^4*c^3*d*e^3*x)*sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 4*(a*b^3*
d^5*e^3*x^5 + 5*a*b^3*c*d^4*e^3*x^4 + (10*a*b^3*c^2 - a*b^3)*d^3*e^3*x^3 +
(10*a*b^3*c^3 - 3*a*b^3*c)*d^2*e^3*x^2 + (5*a*b^3*c^4 - 3*a*b^3*c^2)*d*e^3*
x + (a*b^3*c^5 - a*b^3*c^3)*e^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1))^3 + 6*(a^2*b^2*d^5*e^3*x^5 + 5*a^2*b^2*c*d^4*e^3*x^4 + (10*a^2
*b^2*c^2 - a^2*b^2)*d^3*e^3*x^3 + (10*a^2*b^2*c^3 - 3*a^2*b^2*c)*d^2*e^3*x^
2 + (5*a^2*b^2*c^4 - 3*a^2*b^2*c^2)*d*e^3*x + (a^2*b^2*c^5 - a^2*b^2*c^3)*e
^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*
c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1016 vs. $2(327) = 654$.

Time = 0.38 (sec) , antiderivative size = 1016, normalized size of antiderivative = 2.85

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/4*((d*x + c)^2 - 1)^2*b^4*e^3*arcsin(d*x + c)^4/d - 1/4*(-(d*x + c)^2 + 1
)^(3/2)*(d*x + c)*b^4*e^3*arcsin(d*x + c)^3/d + ((d*x + c)^2 - 1)^2*a*b^3*e
^3*arcsin(d*x + c)^3/d + 1/2*((d*x + c)^2 - 1)*b^4*e^3*arcsin(d*x + c)^4/d
- 3/4*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b^3*e^3*arcsin(d*x + c)^2/d + 5/
8*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^4*e^3*arcsin(d*x + c)^3/d + 1/4*(d*x +
 c)^4*a^4*e^3/d + 3/2*((d*x + c)^2 - 1)^2*a^2*b^2*e^3*arcsin(d*x + c)^2/d -
 3/16*((d*x + c)^2 - 1)^2*b^4*e^3*arcsin(d*x + c)^2/d + 2*((d*x + c)^2 - 1)
*a*b^3*e^3*arcsin(d*x + c)^3/d + 5/32*b^4*e^3*arcsin(d*x + c)^4/d - 3/4*(-(
```

```
d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^2*b^2*e^3*arcsin(d*x + c)/d + 3/32*(-(d*x
 + c)^2 + 1)^(3/2)*(d*x + c)*b^4*e^3*arcsin(d*x + c)/d + 15/8*sqrt(-(d*x +
c)^2 + 1)*(d*x + c)*a*b^3*e^3*arcsin(d*x + c)^2/d + ((d*x + c)^2 - 1)^2*a^3
*b*e^3*arcsin(d*x + c)/d - 3/8*((d*x + c)^2 - 1)^2*a*b^3*e^3*arcsin(d*x + c
)/d + 3*((d*x + c)^2 - 1)*a^2*b^2*e^3*arcsin(d*x + c)^2/d - 15/16*((d*x + c
)^2 - 1)*b^4*e^3*arcsin(d*x + c)^2/d + 5/8*a*b^3*e^3*arcsin(d*x + c)^3/d -
1/4*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^3*b*e^3/d + 3/32*(-(d*x + c)^2 + 1
)^(3/2)*(d*x + c)*a*b^3*e^3/d + 15/8*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^2*b
^2*e^3*arcsin(d*x + c)/d - 51/64*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^4*e^3*a
rcsin(d*x + c)/d - 3/16*((d*x + c)^2 - 1)^2*a^2*b^2*e^3/d + 3/128*((d*x + c
)^2 - 1)^2*b^4*e^3/d + 2*((d*x + c)^2 - 1)*a^3*b*e^3*arcsin(d*x + c)/d - 15
/8*((d*x + c)^2 - 1)*a*b^3*e^3*arcsin(d*x + c)/d + 15/16*a^2*b^2*e^3*arcsin
(d*x + c)^2/d - 51/128*b^4*e^3*arcsin(d*x + c)^2/d + 5/8*sqrt(-(d*x + c)^2
+ 1)*(d*x + c)*a^3*b*e^3/d - 51/64*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a*b^3*e
^3/d - 15/16*((d*x + c)^2 - 1)*a^2*b^2*e^3/d + 51/128*((d*x + c)^2 - 1)*b^4
*e^3/d + 5/8*a^3*b*e^3*arcsin(d*x + c)/d - 51/64*a*b^3*e^3*arcsin(d*x + c)/
d - 51/128*a^2*b^2*e^3/d + 195/1024*b^4*e^3/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^4, x)
```

3.207 $\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 23, antiderivative size = 289

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \frac{160}{27}b^4e^2x+\frac{8b^4e^2(c+dx)^3}{81d}-\frac{160b^3e^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d}-\frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d}$$

```
[Out] 160/27*b^4*e^2*x+8/81*b^4*e^2*(d*x+c)^3/d-8/3*b^2*e^2*(d*x+c)*(a+b*arcsin(d
*x+c))^2/d-4/9*b^2*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^2/d+1/3*e^2*(d*x+c)^3*
(a+b*arcsin(d*x+c))^4/d-160/27*b^3*e^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1
/2)/d-8/27*b^3*e^2*(d*x+c)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+8/9*
b*e^2*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d+4/9*b*e^2*(d*x+c)^2*(a+b*
arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {4889, 12, 4723, 4795, 4767, 4715, 8, 30}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$= -\frac{160b^3e^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} - \frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} + \frac{8b^4e^2(c+dx)^3}{81d} + \frac{160}{27}b^4e^2x$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (160*b^4*e^2*x)/27 + (8*b^4*e^2*(c + d*x)^3)/(81*d) - (160*b^3*e^2*Sqrt[1 -
 (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(27*d) - (8*b^3*e^2*(c + d*x)^2*Sqrt
[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(27*d) - (8*b^2*e^2*(c + d*x)*(a
 + b*ArcSin[c + d*x])^2)/(3*d) - (4*b^2*e^2*(c + d*x)^3*(a + b*ArcSin[c + d
*x])^2)/(9*d) + (8*b*e^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3)/(
9*d) + (4*b*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3
)/(9*d) + (e^2*(c + d*x)^3*(a + b*ArcSin[c + d*x])^4)/(3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^4\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^4\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} - \frac{(4be^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3d}$$

$$= \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} - \frac{(8be^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9d} - \frac{(4b^2e^2)\,\text{Subst}\left(\int x^2(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{3d}$$

$$= -\frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} - \frac{(8b^2e^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^2\,dx, x, c+dx\right)}{3d} + \frac{(8b^3e^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9d}$$

$$= -\frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d} - \frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} + \frac{(16b^3e^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{27d} + \frac{(16b^3e^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3d} + \frac{(8b^4e^2)\,\text{Subst}\left(\int x^2\,dx, x, c+dx\right)}{27d}$$

$$= \frac{8b^4e^2(c+dx)^3}{81d} - \frac{160b^3e^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d} - \frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d} + \frac{(16b^4e^2)\operatorname{Subst}\left(\int 1\,dx, x, c+dx\right)}{27d} + \frac{(16b^4e^2)\operatorname{Subst}\left(\int 1\,dx, x, c+dx\right)}{3d}$$

$$= \frac{160}{27}b^4e^2x + \frac{8b^4e^2(c+dx)^3}{81d} - \frac{160b^3e^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d} - \frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d} - \frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d} + \frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 235, normalized size of antiderivative = 0.81

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$= \frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4 - \frac{4}{9}b\left(-\frac{2}{9}b^3(c+dx)^3 + \frac{2}{3}b^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^4)/3 - (4*b*((-2*b^3*(c + d*x)^3
)/9 + (2*b^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/3 +
 6*b*(c + d*x)*(a + b*ArcSin[c + d*x])^2 + b*(c + d*x)^3*(a + b*ArcSin[c +
d*x])^2 - 2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 - (c + d*x)^2*S
qrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 - (40*b^2*(b*d*x - Sqrt[1 -
(c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3))/9))/d
```

Maple [A] (verified)

Time = 1.19 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.52

method	result
derivativedivides	$\frac{\frac{e^2a^4(dx+c)^3}{3}+e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\frac{160c}{27}\right.}{}$
default	$\frac{\frac{e^2a^4(dx+c)^3}{3}+e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\frac{160c}{27}\right.}{}$
parts	$\frac{e^2a^4(dx+c)^3}{3d}+\frac{e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\right.}{}$

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/3*e^2*a^4*(d*x+c)^3+e^2*b^4*(1/3*(d*x+c)^3*arcsin(d*x+c)^4+4/9*arcsi
n(d*x+c)^3*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-8/3*arcsin(d*x+c)^2*(d*x+c)+16
0/27*d*x+160/27*c-16/3*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)-4/9*(d*x+c)^3*arcs
in(d*x+c)^2-8/27*arcsin(d*x+c)*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)+8/81*(d*x+
c)^3)+4*e^2*a*b^3*(1/3*(d*x+c)^3*arcsin(d*x+c)^3+1/3*arcsin(d*x+c)^2*((d*x+
c)^2+2)*(1-(d*x+c)^2)^(1/2)-4/3*(1-(d*x+c)^2)^(1/2)-4/3*(d*x+c)*arcsin(d*x+
c)-2/9*(d*x+c)^3*arcsin(d*x+c)-2/27*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2))+6*e^
2*a^2*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcsin(d*x+c)*((d*x+c)^2+2)*(1
-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+4*e^2*a^3*b*(1/3*(d*x+c)^3*
arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2/9*(1-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(263) = 526$.

Time = 0.29 (sec) , antiderivative size = 784, normalized size of antiderivative = 2.71

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$=\frac{(27\,a^4-36\,a^2b^2+8\,b^4)d^3e^2x^3+3\,(27\,a^4-36\,a^2b^2+8\,b^4)cd^2e^2x^2-3\,(72\,a^2b^2-160\,b^4-(27\,a^4-36\,a^2b^2}{}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/81*((27*a^4 - 36*a^2*b^2 + 8*b^4)*d^3*e^2*x^3 + 3*(27*a^4 - 36*a^2*b^2 +
8*b^4)*c*d^2*e^2*x^2 - 3*(72*a^2*b^2 - 160*b^4 - (27*a^4 - 36*a^2*b^2 + 8*b
^4)*c^2)*d*e^2*x + 27*(b^4*d^3*e^2*x^3 + 3*b^4*c*d^2*e^2*x^2 + 3*b^4*c^2*d*
e^2*x + b^4*c^3*e^2)*arcsin(d*x + c)^4 + 108*(a*b^3*d^3*e^2*x^3 + 3*a*b^3*c
*d^2*e^2*x^2 + 3*a*b^3*c^2*d*e^2*x + a*b^3*c^3*e^2)*arcsin(d*x + c)^3 + 18*
((9*a^2*b^2 - 2*b^4)*d^3*e^2*x^3 + 3*(9*a^2*b^2 - 2*b^4)*c*d^2*e^2*x^2 - 3*
```

```
(4*b^4 - (9*a^2*b^2 - 2*b^4)*c^2)*d*e^2*x - (12*b^4*c - (9*a^2*b^2 - 2*b^4)
*c^3)*e^2)*arcsin(d*x + c)^2 + 36*((3*a^3*b - 2*a*b^3)*d^3*e^2*x^3 + 3*(3*a
^3*b - 2*a*b^3)*c*d^2*e^2*x^2 - 3*(4*a*b^3 - (3*a^3*b - 2*a*b^3)*c^2)*d*e^2
*x - (12*a*b^3*c - (3*a^3*b - 2*a*b^3)*c^3)*e^2)*arcsin(d*x + c) + 12*((3*a
^3*b - 2*a*b^3)*d^2*e^2*x^2 + 2*(3*a^3*b - 2*a*b^3)*c*d*e^2*x + 3*(b^4*d^2*
e^2*x^2 + 2*b^4*c*d*e^2*x + (b^4*c^2 + 2*b^4)*e^2)*arcsin(d*x + c)^3 + (6*a
^3*b - 40*a*b^3 + (3*a^3*b - 2*a*b^3)*c^2)*e^2 + 9*(a*b^3*d^2*e^2*x^2 + 2*a
*b^3*c*d*e^2*x + (a*b^3*c^2 + 2*a*b^3)*e^2)*arcsin(d*x + c)^2 + ((9*a^2*b^2
 - 2*b^4)*d^2*e^2*x^2 + 2*(9*a^2*b^2 - 2*b^4)*c*d*e^2*x + (18*a^2*b^2 - 40*
b^4 + (9*a^2*b^2 - 2*b^4)*c^2)*e^2)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1889 vs. $2(264) = 528$.

Time = 0.72 (sec) , antiderivative size = 1889, normalized size of antiderivative = 6.54

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*c**2*e**2*x + a**4*c*d*e**2*x**2 + a**4*d**2*e**2*x**3/3 +
4*a**3*b*c**3*e**2*asin(c + d*x)/(3*d) + 4*a**3*b*c**2*e**2*x*asin(c + d*x)
 + 4*a**3*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + 4*a**3*
b*c*d*e**2*x**2*asin(c + d*x) + 8*a**3*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)/9 + 4*a**3*b*d**2*e**2*x**3*asin(c + d*x)/3 + 4*a**3*b*d*e**2*
x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + 8*a**3*b*e**2*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)/(9*d) + 2*a**2*b**2*c**3*e**2*asin(c + d*x)**2/d +
6*a**2*b**2*c**2*e**2*x*asin(c + d*x)**2 - 4*a**2*b**2*c**2*e**2*x/3 + 4*a*
*2*b**2*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d)
 + 6*a**2*b**2*c*d*e**2*x**2*asin(c + d*x)**2 - 4*a**2*b**2*c*d*e**2*x**2/3
 + 8*a**2*b**2*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)
/3 + 2*a**2*b**2*d**2*e**2*x**3*asin(c + d*x)**2 - 4*a**2*b**2*d**2*e**2*x*
*3/9 + 4*a**2*b**2*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
 + d*x)/3 - 8*a**2*b**2*e**2*x/3 + 8*a**2*b**2*e**2*sqrt(-c**2 - 2*c*d*x -
d**2*x**2 + 1)*asin(c + d*x)/(3*d) + 4*a*b**3*c**3*e**2*asin(c + d*x)**3/(3
*d) - 8*a*b**3*c**3*e**2*asin(c + d*x)/(9*d) + 4*a*b**3*c**2*e**2*x*asin(c
+ d*x)**3 - 8*a*b**3*c**2*e**2*x*asin(c + d*x)/3 + 4*a*b**3*c**2*e**2*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(3*d) - 8*a*b**3*c**2*e**
2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(27*d) + 4*a*b**3*c*d*e**2*x**2*asi
n(c + d*x)**3 - 8*a*b**3*c*d*e**2*x**2*asin(c + d*x)/3 + 8*a*b**3*c*e**2*x*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/3 - 16*a*b**3*c*e**2
*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/27 - 16*a*b**3*c*e**2*asin(c + d*x
)/(3*d) + 4*a*b**3*d**2*e**2*x**3*asin(c + d*x)**3/3 - 8*a*b**3*d**2*e**2*x
```

```
**3*asin(c + d*x)/9 + 4*a*b**3*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)*asin(c + d*x)**2/3 - 8*a*b**3*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2
*x**2 + 1)/27 - 16*a*b**3*e**2*x*asin(c + d*x)/3 + 8*a*b**3*e**2*sqrt(-c**2
 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(3*d) - 160*a*b**3*e**2*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/(27*d) + b**4*c**3*e**2*asin(c + d*x)**4/(3
*d) - 4*b**4*c**3*e**2*asin(c + d*x)**2/(9*d) + b**4*c**2*e**2*x*asin(c + d
*x)**4 - 4*b**4*c**2*e**2*x*asin(c + d*x)**2/3 + 8*b**4*c**2*e**2*x/27 + 4*
b**4*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/(9*d)
 - 8*b**4*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(27
*d) + b**4*c*d*e**2*x**2*asin(c + d*x)**4 - 4*b**4*c*d*e**2*x**2*asin(c + d
*x)**2/3 + 8*b**4*c*d*e**2*x**2/27 + 8*b**4*c*e**2*x*sqrt(-c**2 - 2*c*d*x -
 d**2*x**2 + 1)*asin(c + d*x)**3/9 - 16*b**4*c*e**2*x*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)*asin(c + d*x)/27 - 8*b**4*c*e**2*asin(c + d*x)**2/(3*d) +
b**4*d**2*e**2*x**3*asin(c + d*x)**4/3 - 4*b**4*d**2*e**2*x**3*asin(c + d*x
)**2/9 + 8*b**4*d**2*e**2*x**3/81 + 4*b**4*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)**3/9 - 8*b**4*d*e**2*x**2*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)*asin(c + d*x)/27 - 8*b**4*e**2*x*asin(c + d*x)**2/3 +
160*b**4*e**2*x/27 + 8*b**4*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin
(c + d*x)**3/(9*d) - 160*b**4*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*as
in(c + d*x)/(27*d), Ne(d, 0)), (c**2*e**2*x*(a + b*asin(c))**4, True))
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx=\int (dex+ce)^2(b\arcsin(dx+c)+a)^4\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/3*a^4*d^2*e^2*x^3 + a^4*c*d*e^2*x^2 + 2*(2*x^2*arcsin(d*x + c) + d*(3*c^2
*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
(c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^3*b*c*
d*e^2 + 2/9*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4
 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^
2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a
^3*b*d^2*e^2 + a^4*c^2*e^2*x + 4*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x +
c)^2 + 1))*a^3*b*c^2*e^2/d + 1/3*(b^4*d^2*e^2*x^3 + 3*b^4*c*d*e^2*x^2 + 3*b
^4*c^2*e^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + in
tegrate(2/3*(2*(b^4*d^3*e^2*x^3 + 3*b^4*c*d^2*e^2*x^2 + 3*b^4*c^2*d*e^2*x)*
sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqr
t(-d*x - c + 1))^3 + 6*(a*b^3*d^4*e^2*x^4 + 4*a*b^3*c*d^3*e^2*x^3 + (6*a*b^
3*c^2 - a*b^3)*d^2*e^2*x^2 + 2*(2*a*b^3*c^3 - a*b^3*c)*d*e^2*x + (a*b^3*c^4
```

```
 - a*b^3*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3
 + 9*(a^2*b^2*d^4*e^2*x^4 + 4*a^2*b^2*c*d^3*e^2*x^3 + (6*a^2*b^2*c^2 - a^2*
b^2)*d^2*e^2*x^2 + 2*(2*a^2*b^2*c^3 - a^2*b^2*c)*d*e^2*x + (a^2*b^2*c^4 - a
^2*b^2*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/
(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 809 vs. $2(263) = 526$.

Time = 0.40 (sec) , antiderivative size = 809, normalized size of antiderivative = 2.80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \frac{\left((dx+c)^2-1\right)(dx+c)b^4e^2\arcsin(dx+c)^4}{3d} + \frac{4\left((dx+c)^2-1\right)(dx+c)ab^3e^2\arcsin(dx+c)^3}{3d} + \frac{(dx+c)b^4e^2\arcsin(dx+c)^4}{3d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^4e^2\arcsin(dx+c)^3}{9d} + \frac{2\left((dx+c)^2-1\right)(dx+c)a^2b^2e^2\arcsin(dx+c)^2}{d} - \frac{4\left((dx+c)^2-1\right)(dx+c)b^4e^2\arcsin(dx+c)^2}{9d} + \frac{4(dx+c)ab^3e^2\arcsin(dx+c)^3}{3d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}ab^3e^2\arcsin(dx+c)^2}{3d} + \frac{4\sqrt{-(dx+c)^2+1}b^4e^2\arcsin(dx+c)^3}{3d} + \frac{(dx+c)^3a^4e^2}{3d} + \frac{4\left((dx+c)^2-1\right)(dx+c)a^3be^2\arcsin(dx+c)}{3d} - \frac{8\left((dx+c)^2-1\right)(dx+c)ab^3e^2\arcsin(dx+c)}{9d} + \frac{2(dx+c)a^2b^2e^2\arcsin(dx+c)^2}{d} - \frac{28(dx+c)b^4e^2\arcsin(dx+c)^2}{9d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}a^2b^2e^2\arcsin(dx+c)}{3d} + \frac{8\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^4e^2\arcsin(dx+c)}{27d} + \frac{4\sqrt{-(dx+c)^2+1}ab^3e^2\arcsin(dx+c)^2}{d} - \frac{4\left((dx+c)^2-1\right)(dx+c)a^2b^2e^2}{9d} + \frac{8\left((dx+c)^2-1\right)(dx+c)b^4e^2}{81d} + \frac{4(dx+c)a^3be^2\arcsin(dx+c)}{3d} - \frac{56(dx+c)ab^3e^2\arcsin(dx+c)}{9d}$$

$$4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}a^3be^2$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*((d*x + c)^2 - 1)*(d*x + c)*b^4*e^2*arcsin(d*x + c)^4/d + 4/3*((d*x + c
)^2 - 1)*(d*x + c)*a*b^3*e^2*arcsin(d*x + c)^3/d + 1/3*(d*x + c)*b^4*e^2*ar
csin(d*x + c)^4/d - 4/9*(-(d*x + c)^2 + 1)^(3/2)*b^4*e^2*arcsin(d*x + c)^3/
d + 2*((d*x + c)^2 - 1)*(d*x + c)*a^2*b^2*e^2*arcsin(d*x + c)^2/d - 4/9*((d
*x + c)^2 - 1)*(d*x + c)*b^4*e^2*arcsin(d*x + c)^2/d + 4/3*(d*x + c)*a*b^3*
e^2*arcsin(d*x + c)^3/d - 4/3*(-(d*x + c)^2 + 1)^(3/2)*a*b^3*e^2*arcsin(d*x
 + c)^2/d + 4/3*sqrt(-(d*x + c)^2 + 1)*b^4*e^2*arcsin(d*x + c)^3/d + 1/3*(d
*x + c)^3*a^4*e^2/d + 4/3*((d*x + c)^2 - 1)*(d*x + c)*a^3*b*e^2*arcsin(d*x
+ c)/d - 8/9*((d*x + c)^2 - 1)*(d*x + c)*a*b^3*e^2*arcsin(d*x + c)/d + 2*(d
*x + c)*a^2*b^2*e^2*arcsin(d*x + c)^2/d - 28/9*(d*x + c)*b^4*e^2*arcsin(d*x
 + c)^2/d - 4/3*(-(d*x + c)^2 + 1)^(3/2)*a^2*b^2*e^2*arcsin(d*x + c)/d + 8/
27*(-(d*x + c)^2 + 1)^(3/2)*b^4*e^2*arcsin(d*x + c)/d + 4*sqrt(-(d*x + c)^2
 + 1)*a*b^3*e^2*arcsin(d*x + c)^2/d - 4/9*((d*x + c)^2 - 1)*(d*x + c)*a^2*b
^2*e^2/d + 8/81*((d*x + c)^2 - 1)*(d*x + c)*b^4*e^2/d + 4/3*(d*x + c)*a^3*b
*e^2*arcsin(d*x + c)/d - 56/9*(d*x + c)*a*b^3*e^2*arcsin(d*x + c)/d - 4/9*(
-(d*x + c)^2 + 1)^(3/2)*a^3*b*e^2/d + 8/27*(-(d*x + c)^2 + 1)^(3/2)*a*b^3*e
^2/d + 4*sqrt(-(d*x + c)^2 + 1)*a^2*b^2*e^2*arcsin(d*x + c)/d - 56/9*sqrt(-
(d*x + c)^2 + 1)*b^4*e^2*arcsin(d*x + c)/d - 28/9*(d*x + c)*a^2*b^2*e^2/d +
 488/81*(d*x + c)*b^4*e^2/d + 4/3*sqrt(-(d*x + c)^2 + 1)*a^3*b*e^2/d - 56/9
*sqrt(-(d*x + c)^2 + 1)*a*b^3*e^2/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx=\int {\left(c\,e+d\,e\,x\right)}^2\,{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^4 \,d x$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^4,x)
```

```
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^4, x)
```

3.208 $\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 21, antiderivative size = 198

$$\begin{aligned}\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx &= \frac{3b^4e(c+dx)^2}{4d}-\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d}\\ &\quad+\frac{3b^2e(a+b\arcsin(c+dx))^2}{4d}-\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}\\ &\quad+\frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}\\ &\quad-\frac{e(a+b\arcsin(c+dx))^4}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}\end{aligned}$$

```
[Out] 3/4*b^4*e*(d*x+c)^2/d+3/4*b^2*e*(a+b*arcsin(d*x+c))^2/d-3/2*b^2*e*(d*x+c)^2
*(a+b*arcsin(d*x+c))^2/d-1/4*e*(a+b*arcsin(d*x+c))^4/d+1/2*e*(d*x+c)^2*(a+b
*arcsin(d*x+c))^4/d-3/2*b^3*e*(d*x+c)*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/
2)/d+b*e*(d*x+c)*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{4889, 12, 4723, 4795, 4737, 30\}$

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d} - \frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} + \frac{3b^2e(a+b\arcsin(c+dx))^2}{4d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d} - \frac{e(a+b\arcsin(c+dx))^4}{4d} + \frac{3b^4e(c+dx)^2}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (3*b^4*e*(c + d*x)^2)/(4*d) - (3*b^3*e*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a +
 b*ArcSin[c + d*x]))/(2*d) + (3*b^2*e*(a + b*ArcSin[c + d*x])^2)/(4*d) - (3
*b^2*e*(c + d*x)^2*(a + b*ArcSin[c + d*x])^2)/(2*d) + (b*e*(c + d*x)*Sqrt[1
 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3)/d - (e*(a + b*ArcSin[c + d*x])^4
)/(4*d) + (e*(c + d*x)^2*(a + b*ArcSin[c + d*x])^4)/(2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}-\frac{(2be)\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}\\
&= \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}-\frac{(be)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}\\
&\quad-\frac{(3b^2e)\,\text{Subst}\left(\int x(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= -\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}\\
&\quad+\frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}-\frac{e(a+b\arcsin(c+dx))^4}{4d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}+\frac{(3b^3e)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{d}
\end{aligned}
$$

$$= -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d} - \frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} - \frac{e(a+b\arcsin(c+dx))^4}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d} + \frac{(3b^3e)\operatorname{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d} + \frac{(3b^4e)\operatorname{Subst}(\int x\,dx, x, c+dx)}{2d}$$

$$= \frac{3b^4e(c+dx)^2}{4d} - \frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d} + \frac{3b^2e(a+b\arcsin(c+dx))^2}{4d} - \frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} - \frac{e(a+b\arcsin(c+dx))^4}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 163, normalized size of antiderivative = 0.82

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = -\frac{e\left(-4b(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3 + (a+b\arcsin(c+dx))^4 - 2(c+dx)^2(a+b\arcsin\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] -1/4*(e*(-4*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 + (
a + b*ArcSin[c + d*x])^4 - 2*(c + d*x)^2*(a + b*ArcSin[c + d*x])^4 + 3*b^2*
(-(b^2*(c + d*x)^2) + 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c +
 d*x]) - (a + b*ArcSin[c + d*x])^2 + 2*(c + d*x)^2*(a + b*ArcSin[c + d*x])^
2)))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 411 vs. $2(182) = 364$.

Time = 0.88 (sec) , antiderivative size = 412, normalized size of antiderivative = 2.08

method	result
derivativedivides	$\frac{\frac{e\,a^4(dx+c)^2}{2}+e\,b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3\left((dx+c)^2-1\right)\text{ar}}{2}\right.}{}$
default	$\frac{\frac{e\,a^4(dx+c)^2}{2}+e\,b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3\left((dx+c)^2-1\right)\text{ar}}{2}\right.}{}$
parts	$e\,a^4\left(\frac{1}{2}d\,x^2+cx\right)+\frac{e\,b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3(}{}\right.}{}$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(1/2*e*a^4*(d*x+c)^2+e*b^4*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^4+arcsin(d*
x+c)^3*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-3/2*((d*x+c)^2-1)*arcsin
(d*x+c)^2-3/2*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))+3/4
*arcsin(d*x+c)^2+3/4*(d*x+c)^2-3/4*arcsin(d*x+c)^4)+4*e*a*b^3*(1/2*((d*x+c)
^2-1)*arcsin(d*x+c)^3+3/4*arcsin(d*x+c)^2*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcs
in(d*x+c))-3/4*((d*x+c)^2-1)*arcsin(d*x+c)-3/8*(d*x+c)*(1-(d*x+c)^2)^(1/2)-
3/8*arcsin(d*x+c)-1/2*arcsin(d*x+c)^3)+6*e*a^2*b^2*(1/2*((d*x+c)^2-1)*arcsi
n(d*x+c)^2+1/2*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-1/
4*arcsin(d*x+c)^2-1/4*(d*x+c)^2)+4*e*a^3*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4
*(d*x+c)*(1-(d*x+c)^2)^(1/2)-1/4*arcsin(d*x+c)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 483 vs. $2(182) = 364$.

Time = 0.28 (sec) , antiderivative size = 483, normalized size of antiderivative = 2.44

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx$$
$$=\frac{(2\,a^4-6\,a^2b^2+3\,b^4)d^2ex^2+2\,(2\,a^4-6\,a^2b^2+3\,b^4)cdex+(2\,b^4d^2ex^2+4\,b^4cdex+(2\,b^4c^2-b^4)e)\arcsin(}{}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/4*((2*a^4 - 6*a^2*b^2 + 3*b^4)*d^2*e*x^2 + 2*(2*a^4 - 6*a^2*b^2 + 3*b^4)*
c*d*e*x + (2*b^4*d^2*e*x^2 + 4*b^4*c*d*e*x + (2*b^4*c^2 - b^4)*e)*arcsin(d*
x + c)^4 + 4*(2*a*b^3*d^2*e*x^2 + 4*a*b^3*c*d*e*x + (2*a*b^3*c^2 - a*b^3)*e
)*arcsin(d*x + c)^3 + 3*(2*(2*a^2*b^2 - b^4)*d^2*e*x^2 + 4*(2*a^2*b^2 - b^4
```

```
)*c*d*e*x - (2*a^2*b^2 - b^4 - 2*(2*a^2*b^2 - b^4)*c^2)*e)*arcsin(d*x + c)^
2 + 2*(2*(2*a^3*b - 3*a*b^3)*d^2*e*x^2 + 4*(2*a^3*b - 3*a*b^3)*c*d*e*x - (2
*a^3*b - 3*a*b^3 - 2*(2*a^3*b - 3*a*b^3)*c^2)*e)*arcsin(d*x + c) + 2*((2*a^
3*b - 3*a*b^3)*d*e*x + 2*(b^4*d*e*x + b^4*c*e)*arcsin(d*x + c)^3 + (2*a^3*b
 - 3*a*b^3)*c*e + 6*(a*b^3*d*e*x + a*b^3*c*e)*arcsin(d*x + c)^2 + 3*((2*a^2
*b^2 - b^4)*d*e*x + (2*a^2*b^2 - b^4)*c*e)*arcsin(d*x + c))*sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1027 vs. 2(178) = 356.

Time = 0.49 (sec) , antiderivative size = 1027, normalized size of antiderivative = 5.19

$$\int (ce + dex)(a + b \arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*c*e*x + a**4*d*e*x**2/2 + 2*a**3*b*c**2*e*asin(c + d*x)/d +
 4*a**3*b*c*e*x*asin(c + d*x) + a**3*b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/d + 2*a**3*b*d*e*x**2*asin(c + d*x) + a**3*b*e*x*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1) - a**3*b*e*asin(c + d*x)/d + 3*a**2*b**2*c**2*e*asin(c +
d*x)**2/d + 6*a**2*b**2*c*e*x*asin(c + d*x)**2 - 3*a**2*b**2*c*e*x + 3*a**2
*b**2*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 3*a**2*b*
*2*d*e*x**2*asin(c + d*x)**2 - 3*a**2*b**2*d*e*x**2/2 + 3*a**2*b**2*e*x*sqr
t(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x) - 3*a**2*b**2*e*asin(c + d
*x)**2/(2*d) + 2*a*b**3*c**2*e*asin(c + d*x)**3/d - 3*a*b**3*c**2*e*asin(c
+ d*x)/d + 4*a*b**3*c*e*x*asin(c + d*x)**3 - 6*a*b**3*c*e*x*asin(c + d*x) +
 3*a*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/d - 3*
a*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(2*d) + 2*a*b**3*d*e*x**2*
asin(c + d*x)**3 - 3*a*b**3*d*e*x**2*asin(c + d*x) + 3*a*b**3*e*x*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2 - 3*a*b**3*e*x*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)/2 - a*b**3*e*asin(c + d*x)**3/d + 3*a*b**3*e*asin(c
 + d*x)/(2*d) + b**4*c**2*e*asin(c + d*x)**4/(2*d) - 3*b**4*c**2*e*asin(c +
 d*x)**2/(2*d) + b**4*c*e*x*asin(c + d*x)**4 - 3*b**4*c*e*x*asin(c + d*x)**
2 + 3*b**4*c*e*x/2 + b**4*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)**3/d - 3*b**4*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x
)/(2*d) + b**4*d*e*x**2*asin(c + d*x)**4/2 - 3*b**4*d*e*x**2*asin(c + d*x)*
*2/2 + 3*b**4*d*e*x**2/4 + b**4*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*a
sin(c + d*x)**3 - 3*b**4*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c +
 d*x)/2 - b**4*e*asin(c + d*x)**4/(4*d) + 3*b**4*e*asin(c + d*x)**2/(4*d),
Ne(d, 0)), (c*e*x*(a + b*asin(c))**4, True))
```

Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx=\int (dex+ce)(b\arcsin{(dx+c)}+a)^4\,dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/2*a^4*d*e*x^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/s
qrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^
2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^3*b*d*e + a^4*c*e*x + 4*((d*x
+ c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^3*b*c*e/d + 1/2*(b^4*d*e*x
^2 + 2*b^4*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4
+ integrate(2*((b^4*d^2*e*x^2 + 2*b^4*c*d*e*x)*sqrt(d*x + c + 1)*sqrt(-d*x
- c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 2*(a*b^
3*d^3*e*x^3 + 3*a*b^3*c*d^2*e*x^2 + (3*a*b^3*c^2 - a*b^3)*d*e*x + (a*b^3*c^
3 - a*b^3*c)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 +
3*(a^2*b^2*d^3*e*x^3 + 3*a^2*b^2*c*d^2*e*x^2 + (3*a^2*b^2*c^2 - a^2*b^2)*d*
e*x + (a^2*b^2*c^3 - a^2*b^2*c)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(
-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 533 vs. $2(182) = 364$.

Time = 0.37 (sec) , antiderivative size = 533, normalized size of antiderivative = 2.69

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = \frac{\left((dx+c)^2-1\right)b^4e\arcsin(dx+c)^4}{2\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)b^4e\arcsin(dx+c)^3}{d} + \frac{2\left((dx+c)^2-1\right)ab^3e\arcsin(dx+c)^3}{d} + \frac{b^4e\arcsin(dx+c)^4}{4\,d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^3e\arcsin(dx+c)^2}{d} + \frac{3\left((dx+c)^2-1\right)a^2b^2e\arcsin(dx+c)^2}{d} - \frac{3\left((dx+c)^2-1\right)b^4e\arcsin(dx+c)^2}{2\,d} + \frac{ab^3e\arcsin(dx+c)^3}{d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)a^2b^2e\arcsin(dx+c)}{d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^4e\arcsin(dx+c)}{2\,d} + \frac{2\left((dx+c)^2-1\right)a^3be\arcsin(dx+c)}{d} - \frac{3\left((dx+c)^2-1\right)ab^3e\arcsin(dx+c)}{d} + \frac{3\,a^2b^2e\arcsin(dx+c)^2}{2\,d} - \frac{3\,b^4e\arcsin(dx+c)^2}{4\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)a^3be}{d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^3e}{2\,d} + \frac{\left((dx+c)^2-1\right)a^4e}{2\,d} - \frac{3\left((dx+c)^2-1\right)a^2b^2e}{2\,d} + \frac{3\left((dx+c)^2-1\right)b^4e}{4\,d} + \frac{a^3be\arcsin(dx+c)}{d} - \frac{3\,ab^3e\arcsin(dx+c)}{2\,d} - \frac{3\,a^2b^2e}{4\,d} + \frac{3\,b^4e}{8\,d}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/2*((d*x + c)^2 - 1)*b^4*e*arcsin(d*x + c)^4/d + sqrt(-(d*x + c)^2 + 1)*(d
*x + c)*b^4*e*arcsin(d*x + c)^3/d + 2*((d*x + c)^2 - 1)*a*b^3*e*arcsin(d*x
+ c)^3/d + 1/4*b^4*e*arcsin(d*x + c)^4/d + 3*sqrt(-(d*x + c)^2 + 1)*(d*x +
c)*a*b^3*e*arcsin(d*x + c)^2/d + 3*((d*x + c)^2 - 1)*a^2*b^2*e*arcsin(d*x +
 c)^2/d - 3/2*((d*x + c)^2 - 1)*b^4*e*arcsin(d*x + c)^2/d + a*b^3*e*arcsin(
d*x + c)^3/d + 3*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^2*b^2*e*arcsin(d*x + c)
/d - 3/2*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^4*e*arcsin(d*x + c)/d + 2*((d*x
 + c)^2 - 1)*a^3*b*e*arcsin(d*x + c)/d - 3*((d*x + c)^2 - 1)*a*b^3*e*arcsin
(d*x + c)/d + 3/2*a^2*b^2*e*arcsin(d*x + c)^2/d - 3/4*b^4*e*arcsin(d*x + c)
^2/d + sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^3*b*e/d - 3/2*sqrt(-(d*x + c)^2 +
 1)*(d*x + c)*a*b^3*e/d + 1/2*((d*x + c)^2 - 1)*a^4*e/d - 3/2*((d*x + c)^2
- 1)*a^2*b^2*e/d + 3/4*((d*x + c)^2 - 1)*b^4*e/d + a^3*b*e*arcsin(d*x + c)/
d - 3/2*a*b^3*e*arcsin(d*x + c)/d - 3/4*a^2*b^2*e/d + 3/8*b^4*e/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^4\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^4, x)
```

3.209 $\int (a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 12, antiderivative size = 119

$$\int (a+b\arcsin(c+dx))^4\,dx = 24b^4x-\frac{24b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d}-\frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d}+\frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^4}{d}$$

```
[Out] 24*b^4*x-12*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^2/d+(d*x+c)*(a+b*arcsin(d*x+c))
^4/d-24*b^3*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+4*b*(a+b*arcsin(d*x+c
))^3*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4887, 4715, 4767, 8}

$$\int (a+b\arcsin(c+dx))^4\,dx = -\frac{24b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d}-\frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d}+\frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^4}{d}+24b^4x$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] 24*b^4*x - (24*b^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/d - (12*b
^2*(c + d*x)*(a + b*ArcSin[c + d*x])^2)/d + (4*b*Sqrt[1 - (c + d*x)^2]*(a +
 b*ArcSin[c + d*x])^3)/d + ((c + d*x)*(a + b*ArcSin[c + d*x])^4)/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^4\,dx, x, c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d} - \frac{(4b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d}\\
&\quad - \frac{(12b^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^2\,dx, x, c+dx\right)}{d}\\
&= -\frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d} + \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d} + \frac{(24b^3)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}
\end{aligned}$$

$$= -\frac{24b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d} - \frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d} + \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d} + \frac{(24b^4)\operatorname{Subst}(\int 1\,dx, x, c+dx)}{d}$$

$$= 24b^4x - \frac{24b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d} - \frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d} + \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.97

$$\int (a+b\arcsin(c+dx))^4\,dx$$

$$= \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3 + (c+dx)(a+b\arcsin(c+dx))^4 - 12b^2\left(-2b^2(c+dx) + 2b\sqrt{1-\right.}{d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (4*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 + (c + d*x)*(a + b*Arc
Sin[c + d*x])^4 - 12*b^2*(-2*b^2*(c + d*x) + 2*b*Sqrt[1 - (c + d*x)^2]*(a +
 b*ArcSin[c + d*x]) + (c + d*x)*(a + b*ArcSin[c + d*x])^2))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 254 vs. 2(115) = 230.

Time = 0.66 (sec) , antiderivative size = 255, normalized size of antiderivative = 2.14

method	result
derivativedivides	$\frac{(dx+c)a^4+b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(dx\right.}{}$
default	$\frac{(dx+c)a^4+b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(dx\right.}{}$
parts	$x\,a^4+\frac{b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(dx+\right.}{d}$

```
[In] int((a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*((d*x+c)*a^4+b^4*(arcsin(d*x+c)^4*(d*x+c)+4*arcsin(d*x+c)^3*(1-(d*x+c)^
2)^(1/2)-12*arcsin(d*x+c)^2*(d*x+c)+24*d*x+24*c-24*arcsin(d*x+c)*(1-(d*x+c)
```

```
^2)^(1/2))+4*a*b^3*(arcsin(d*x+c)^3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)^2)
^(1/2)-6*(1-(d*x+c)^2)^(1/2)-6*(d*x+c)*arcsin(d*x+c))+6*a^2*b^2*(arcsin(d*x
+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+4*a^3*b*((d*x+
c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(115) = 230$.

Time = 0.27 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.96

$$\int (a + b \arcsin(c + dx))^4 \, dx$$
$$= \frac{(b^4dx + b^4c) \arcsin{(dx + c)}^4 + 4\,(ab^3dx + ab^3c) \arcsin{(dx + c)}^3 + (a^4 - 12\,a^2b^2 + 24\,b^4)dx + 6\,((a^2b^2 - 2$$

```
[In] integrate((a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] ((b^4*d*x + b^4*c)*arcsin(d*x + c)^4 + 4*(a*b^3*d*x + a*b^3*c)*arcsin(d*x +
 c)^3 + (a^4 - 12*a^2*b^2 + 24*b^4)*d*x + 6*((a^2*b^2 - 2*b^4)*d*x + (a^2*b
^2 - 2*b^4)*c)*arcsin(d*x + c)^2 + 4*((a^3*b - 6*a*b^3)*d*x + (a^3*b - 6*a*
b^3)*c)*arcsin(d*x + c) + 4*(b^4*arcsin(d*x + c)^3 + 3*a*b^3*arcsin(d*x + c
)^2 + a^3*b - 6*a*b^3 + 3*(a^2*b^2 - 2*b^4)*arcsin(d*x + c))*sqrt(-d^2*x^2
- 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 444 vs. $2(105) = 210$.

Time = 0.26 (sec) , antiderivative size = 444, normalized size of antiderivative = 3.73

$$\int (a + b \arcsin(c + dx))^4 \, dx$$
$$= \begin{cases} a^4x + \frac{4a^3bc \operatorname{asin}{(c+dx)}}{d} + 4a^3bx \operatorname{asin}{(c + dx)} + \frac{4a^3b\sqrt{-c^2-2cdx-d^2x^2+1}}{d} + \frac{6a^2b^2c \operatorname{asin}^2{(c+dx)}}{d} + 6a^2b^2x \operatorname{asin}^2{(c + c} \\ x(a + b \operatorname{asin}{(c)})^4 \end{cases}$$

```
[In] integrate((a+b*asin(d*x+c))**4,x)
```

```
[Out] Piecewise((a**4*x + 4*a**3*b*c*asin(c + d*x)/d + 4*a**3*b*x*asin(c + d*x) +
 4*a**3*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 6*a**2*b**2*c*asin(c +
d*x)**2/d + 6*a**2*b**2*x*asin(c + d*x)**2 - 12*a**2*b**2*x + 12*a**2*b**2*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 4*a*b**3*c*asin(c +
 d*x)**3/d - 24*a*b**3*c*asin(c + d*x)/d + 4*a*b**3*x*asin(c + d*x)**3 - 24
*a*b**3*x*asin(c + d*x) + 12*a*b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*a
sin(c + d*x)**2/d - 24*a*b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + b**
```

```
4*c*asin(c + d*x)**4/d - 12*b**4*c*asin(c + d*x)**2/d + b**4*x*asin(c + d*x
)**4 - 12*b**4*x*asin(c + d*x)**2 + 24*b**4*x + 4*b**4*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)**3/d - 24*b**4*sqrt(-c**2 - 2*c*d*x - d**2*
x**2 + 1)*asin(c + d*x)/d, Ne(d, 0)), (x*(a + b*asin(c))**4, True))
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^4\,dx=\int (b\arcsin(dx+c)+a)^4\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] b^4*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + a^4*x + 4*
((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^3*b/d + integrate(2*
(2*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^4*d*x*arctan2(d*x + c, sqrt(d*x +
 c + 1)*sqrt(-d*x - c + 1))^3 + 2*(a*b^3*d^2*x^2 + 2*a*b^3*c*d*x + a*b^3*c^
2 - a*b^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 3*(a^
2*b^2*d^2*x^2 + 2*a^2*b^2*c*d*x + a^2*b^2*c^2 - a^2*b^2)*arctan2(d*x + c, s
qrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 329 vs. $2(115) = 230$.

Time = 0.30 (sec) , antiderivative size = 329, normalized size of antiderivative = 2.76

$$\int (a+b\arcsin(c+dx))^4\,dx = \frac{(dx+c)b^4\arcsin{(dx+c)}^4}{d} + \frac{4\,(dx+c)ab^3\arcsin{(dx+c)}^3}{d} + \frac{4\,\sqrt{-(dx+c)^2+1}b^4\arcsin{(dx+c)}^3}{d} + \frac{6\,(dx+c)a^2b^2\arcsin{(dx+c)}^2}{d} - \frac{12\,(dx+c)b^4\arcsin{(dx+c)}^2}{d} + \frac{12\,\sqrt{-(dx+c)^2+1}ab^3\arcsin{(dx+c)}^2}{d} + \frac{4\,(dx+c)a^3b\arcsin{(dx+c)}}{d} - \frac{24\,(dx+c)ab^3\arcsin{(dx+c)}}{d} + \frac{12\,\sqrt{-(dx+c)^2+1}a^2b^2\arcsin{(dx+c)}}{d} - \frac{24\,\sqrt{-(dx+c)^2+1}b^4\arcsin{(dx+c)}}{d} + \frac{(dx+c)a^4}{d} - \frac{12\,(dx+c)a^2b^2}{d} + \frac{24\,(dx+c)b^4}{d} + \frac{4\,\sqrt{-(dx+c)^2+1}a^3b}{d} - \frac{24\,\sqrt{-(dx+c)^2+1}ab^3}{d}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] (d*x + c)*b^4*arcsin(d*x + c)^4/d + 4*(d*x + c)*a*b^3*arcsin(d*x + c)^3/d +
 4*sqrt(-(d*x + c)^2 + 1)*b^4*arcsin(d*x + c)^3/d + 6*(d*x + c)*a^2*b^2*arc
sin(d*x + c)^2/d - 12*(d*x + c)*b^4*arcsin(d*x + c)^2/d + 12*sqrt(-(d*x + c
)^2 + 1)*a*b^3*arcsin(d*x + c)^2/d + 4*(d*x + c)*a^3*b*arcsin(d*x + c)/d -
24*(d*x + c)*a*b^3*arcsin(d*x + c)/d + 12*sqrt(-(d*x + c)^2 + 1)*a^2*b^2*ar
csin(d*x + c)/d - 24*sqrt(-(d*x + c)^2 + 1)*b^4*arcsin(d*x + c)/d + (d*x +
c)*a^4/d - 12*(d*x + c)*a^2*b^2/d + 24*(d*x + c)*b^4/d + 4*sqrt(-(d*x + c)^
2 + 1)*a^3*b/d - 24*sqrt(-(d*x + c)^2 + 1)*a*b^3/d
```

Mupad [B] (verification not implemented)

Time = 0.61 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.92

$$\int (a+b\arcsin(c+dx))^4\,dx$$
$$= a^4\,x + \frac{b^4\,(c+d\,x)\,\left(\mathrm{asin}(c+d\,x)^4-12\,\mathrm{asin}(c+d\,x)^2+24\right)}{d}$$
$$- \frac{b^4\,\left(24\,\mathrm{asin}(c+d\,x)-4\,\mathrm{asin}(c+d\,x)^3\right)\,\sqrt{1-(c+d\,x)^2}}{d}$$
$$+ \frac{6\,a^2\,b^2\,\left(2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-(c+d\,x)^2}+\left(\mathrm{asin}(c+d\,x)^2-2\right)\,(c+d\,x)\right)}{d}$$
$$+ \frac{4\,a^3\,b\,\left(\sqrt{1-(c+d\,x)^2}+\mathrm{asin}(c+d\,x)\,(c+d\,x)\right)}{d}$$
$$+ \frac{4\,a\,b^3\,\left(3\,\mathrm{asin}(c+d\,x)^2-6\right)\,\sqrt{1-(c+d\,x)^2}}{d}$$
$$- \frac{4\,a\,b^3\,\left(6\,\mathrm{asin}(c+d\,x)-\mathrm{asin}(c+d\,x)^3\right)\,(c+d\,x)}{d}$$

```
[In] int((a + b*asin(c + d*x))^4,x)
```

```
[Out] a^4*x + (b^4*(c + d*x)*(asin(c + d*x)^4 - 12*asin(c + d*x)^2 + 24))/d - (b^
4*(24*asin(c + d*x) - 4*asin(c + d*x)^3)*(1 - (c + d*x)^2)^(1/2))/d + (6*a^
2*b^2*(2*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d*x)^2 - 2)*(c +
 d*x)))/d + (4*a^3*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*x)*(c + d*x)))/d
 + (4*a*b^3*(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x)^2)^(1/2))/d - (4*a*b^3*(
6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))/d
```

3.210 $\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 202

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3ib^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3b^4\,\text{PolyLog}\left(5,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[Out] -1/5*I*(a+b*arcsin(d*x+c))^5/b/d/e+(a+b*arcsin(d*x+c))^4*ln(1-(I*(d*x+c)+(1
-(d*x+c)^2)^(1/2))^2)/d/e-2*I*b*(a+b*arcsin(d*x+c))^3*polylog(2,(I*(d*x+c)+
(1-(d*x+c)^2)^(1/2))^2)/d/e+3*b^2*(a+b*arcsin(d*x+c))^2*polylog(3,(I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3*I*b^3*(a+b*arcsin(d*x+c))*polylog(4,(I*(d*x
+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e-3/2*b^4*polylog(5,(I*(d*x+c)+(1-(d*x+c)^2)^
(1/2))^2)/d/e
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {4889, 12, 4721, 3798, 2221, 2611, 6744, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de} + \frac{3b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de} - \frac{2ib\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3}{de} - \frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4}{de} - \frac{3b^4\operatorname{PolyLog}\left(5,e^{2i\arcsin(c+dx)}\right)}{2de}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x),x]
```

```
[Out] ((-1/5*I)*(a + b*ArcSin[c + d*x])^5)/(b*d*e) + ((a + b*ArcSin[c + d*x])^4*L
og[1 - E^((2*I)*ArcSin[c + d*x])])/(d*e) - ((2*I)*b*(a + b*ArcSin[c + d*x])
^3*PolyLog[2, E^((2*I)*ArcSin[c + d*x])])/(d*e) + (3*b^2*(a + b*ArcSin[c +
d*x])^2*PolyLog[3, E^((2*I)*ArcSin[c + d*x])])/(d*e) + ((3*I)*b^3*(a + b*Ar
cSin[c + d*x])*PolyLog[4, E^((2*I)*ArcSin[c + d*x])])/(d*e) - (3*b^4*PolyLo
g[5, E^((2*I)*ArcSin[c + d*x])])/(2*d*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{ex}\,dx, x, c+dx\right)}{d}$$

$$= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{x}\,dx, x, c+dx\right)}{de}$$

$$= \frac{\text{Subst}\left(\int (a+bx)^4\cot(x)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^4}{1-e^{2ix}}\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{(4b)\text{Subst}\left(\int (a+bx)^3\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{de} + \frac{(6ib^2)\,\text{Subst}\left(\int (a+bx)^2\text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\text{PolyLog}\left(3, e^{2i\arcsin(c+dx)}\right)}{de} - \frac{(6b^3)\,\text{Subst}\left(\int (a+bx)\text{PolyLog}\left(3, e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\text{PolyLog}\left(2, e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\text{PolyLog}\left(3, e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3ib^3(a+b\arcsin(c+dx))\text{PolyLog}\left(4, e^{2i\arcsin(c+dx)}\right)}{de} - \frac{(3ib^4)\,\text{Subst}\left(\int \text{PolyLog}\left(4, e^{2ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3ib^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{de} - \frac{(3b^4)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(4,x)}{x}dx,x,e^{2i\arcsin(c+dx)}\right)}{2de}$$

$$= -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3ib^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3b^4\operatorname{PolyLog}\left(5,e^{2i\arcsin(c+dx)}\right)}{2de}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 439 vs. $2(202) = 404$.

Time = 0.81 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.17

$$\int\frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$$

$$= \frac{16a^4\log(c+dx) + 64a^3b\left(\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right) - \frac{1}{2}i\left(\arcsin(c+dx)^2 + \operatorname{PolyLog}\left(2,e^{2i\arcs\right.\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x),x]
```

```
[Out] (16*a^4*Log[c + d*x] + 64*a^3*b*(ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c
+ d*x])] - (I/2)*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])]
)) + 4*a^2*b^2*((-I)*Pi^3 + (8*I)*ArcSin[c + d*x]^3 + 24*ArcSin[c + d*x]^2*
Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (24*I)*ArcSin[c + d*x]*PolyLog[2, E^(
(-2*I)*ArcSin[c + d*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[c + d*x])]) - I*a
*b^3*(Pi^4 - 16*ArcSin[c + d*x]^4 + (64*I)*ArcSin[c + d*x]^3*Log[1 - E^((-2
*I)*ArcSin[c + d*x])] - 96*ArcSin[c + d*x]^2*PolyLog[2, E^((-2*I)*ArcSin[c
+ d*x])] + (96*I)*ArcSin[c + d*x]*PolyLog[3, E^((-2*I)*ArcSin[c + d*x])] +
```

```
48*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])]) + 16*b^4*((-1/160*I)*Pi^5 + (I/5
)*ArcSin[c + d*x]^5 + ArcSin[c + d*x]^4*Log[1 - E^((-2*I)*ArcSin[c + d*x])]
 + (2*I)*ArcSin[c + d*x]^3*PolyLog[2, E^((-2*I)*ArcSin[c + d*x])] + 3*ArcSi
n[c + d*x]^2*PolyLog[3, E^((-2*I)*ArcSin[c + d*x])] - (3*I)*ArcSin[c + d*x]
*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])] - (3*PolyLog[5, E^((-2*I)*ArcSin[c
+ d*x])])/2))/(16*d*e)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1006 vs. 2(255) = 510.

Time = 0.81 (sec) , antiderivative size = 1007, normalized size of antiderivative = 4.99

method	result	size
derivativedivides	Expression too large to display	1007
default	Expression too large to display	1007
parts	Expression too large to display	1018

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(a^4/e*ln(d*x+c)+b^4/e*(-1/5*I*arcsin(d*x+c)^5+arcsin(d*x+c)^4*ln(1+I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))-4*I*arcsin(d*x+c)^3*polylog(2,-I*(d*x+c)-(1-(d*
x+c)^2)^(1/2))+12*arcsin(d*x+c)^2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))
+24*I*arcsin(d*x+c)*polylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-24*polylog(5,
-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^4*ln(1-I*(d*x+c)-(1-(d*x+c)^2
)^(1/2))-4*I*arcsin(d*x+c)^3*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+12*ar
csin(d*x+c)^2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+24*I*arcsin(d*x+c)*p
olylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-24*polylog(5,I*(d*x+c)+(1-(d*x+c)^2
)^(1/2)))+4*a*b^3/e*(-1/4*I*arcsin(d*x+c)^4+arcsin(d*x+c)^3*ln(1-I*(d*x+c)-
(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^
(1/2))+6*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*I*polylog
(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^3*ln(1+I*(d*x+c)+(1-(d*x+c)
^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+6*
arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+6*I*polylog(4,-I*(d
*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e*(-1/3*I*arcsin(d*x+c)^3+arcsin(d*x+
c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,-I*(d*
x+c)-(1-(d*x+c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsi
n(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,
I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+
4*a^3*b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2
)^(1/2))-I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)*ln(1-I*(
d*x+c)-(1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^4}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="fricas")
```

```
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d*e*x + c*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \frac{\int \frac{a^4}{c+dx}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c+dx}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c+dx}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c+dx}\,dx + \int \frac{4a^3b\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e),x)
```

```
[Out] (Integral(a**4/(c + d*x), x) + Integral(b**4*asin(c + d*x)**4/(c + d*x), x)
 + Integral(4*a*b**3*asin(c + d*x)**3/(c + d*x), x) + Integral(6*a**2*b**2*
asin(c + d*x)**2/(c + d*x), x) + Integral(4*a**3*b*asin(c + d*x)/(c + d*x),
 x))/e
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^4}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="maxima")
```

```
[Out] a^4*log(d*e*x + c*e)/(d*e) + integrate((b^4*arctan2(d*x + c, sqrt(d*x + c +
 1)*sqrt(-d*x - c + 1))^4 + 4*a*b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1))^3 + 6*a^2*b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
- c + 1))^2 + 4*a^3*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)
))/(d*e*x + c*e), x)
```

Giac [F]

$$\int \frac{(a + b \arcsin(c + dx))^4}{ce + dex} \, dx = \int \frac{(b \arcsin(dx + c) + a)^4}{dex + ce} \, dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + b \arcsin(c + dx))^4}{ce + dex} \, dx = \int \frac{(a + b \operatorname{asin}(c + d x))^4}{c e + d e x} \, dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x), x)
```

3.211 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 270

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx &= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)}\\ &\quad-\frac{8b(a+b\arcsin(c+dx))^3\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad+\frac{12ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad-\frac{12ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad-\frac{24b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad+\frac{24b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad-\frac{24ib^4\operatorname{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^2}\\ &\quad+\frac{24ib^4\operatorname{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^2}\end{aligned}$$

```
[Out] -(a+b*arcsin(d*x+c))^4/d/e^2/(d*x+c)-8*b*(a+b*arcsin(d*x+c))^3*arctanh(I*(d
*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+12*I*b^2*(a+b*arcsin(d*x+c))^2*polylog(2,-
I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2-12*I*b^2*(a+b*arcsin(d*x+c))^2*polylog
(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-24*b^3*(a+b*arcsin(d*x+c))*polylog(
3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2+24*b^3*(a+b*arcsin(d*x+c))*polylog(
3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-24*I*b^4*polylog(4,-I*(d*x+c)-(1-(d*
x+c)^2)^(1/2))/d/e^2+24*I*b^4*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^
2
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {4889, 12, 4723, 4803, 4268, 2611, 6744, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = -\frac{8b\,\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3}{de^2} - \frac{24b^3\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^2} + \frac{24b^3\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^2} + \frac{12ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^2} - \frac{12ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^2} - \frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{24ib^4\,\text{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{24ib^4\,\text{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^2,x]
```

```
[Out] -((a + b*ArcSin[c + d*x])^4/(d*e^2*(c + d*x))) - (8*b*(a + b*ArcSin[c + d*x
])^3*ArcTanh[E^(I*ArcSin[c + d*x])])/(d*e^2) + ((12*I)*b^2*(a + b*ArcSin[c
+ d*x])^2*PolyLog[2, -E^(I*ArcSin[c + d*x])])/(d*e^2) - ((12*I)*b^2*(a + b*
ArcSin[c + d*x])^2*PolyLog[2, E^(I*ArcSin[c + d*x])])/(d*e^2) - (24*b^3*(a
+ b*ArcSin[c + d*x])*PolyLog[3, -E^(I*ArcSin[c + d*x])])/(d*e^2) + (24*b^3*
(a + b*ArcSin[c + d*x])*PolyLog[3, E^(I*ArcSin[c + d*x])])/(d*e^2) - ((24*I
)*b^4*PolyLog[4, -E^(I*ArcSin[c + d*x])])/(d*e^2) + ((24*I)*b^4*PolyLog[4,
E^(I*ArcSin[c + d*x])])/(d*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
```

```
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{e^2x^2}\,dx, x, c+dx\right)}{d} \\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{x^2}\,dx, x, c+dx\right)}{de^2} \\
&= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} + \frac{(4b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^2} \\
&= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} + \frac{(4b)\text{Subst}\left(\int (a+bx)^3\csc(x)\,dx, x, \arcsin(c+dx)\right)}{de^2} \\
&= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{8b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} \\
&\quad - \frac{(12b^2)\,\text{Subst}\left(\int (a+bx)^2\log\left(1-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} \\
&\quad + \frac{(12b^2)\,\text{Subst}\left(\int (a+bx)^2\log\left(1+e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} \\
&= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{8b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} \\
&\quad + \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} \\
&\quad - \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} \\
&\quad - \frac{(24ib^3)\,\text{Subst}\left(\int (a+bx)\,\text{PolyLog}\left(2,-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2} \\
&\quad + \frac{(24ib^3)\,\text{Subst}\left(\int (a+bx)\,\text{PolyLog}\left(2,e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^2}
\end{aligned}$$

$$= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{8b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{(24b^4)\,\text{Subst}\left(\int \text{PolyLog}\left(3,-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^2} - \frac{(24b^4)\,\text{Subst}\left(\int \text{PolyLog}\left(3,e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{8b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{(24ib^4)\,\text{Subst}\left(\int \frac{\text{PolyLog}(3,-x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{(24ib^4)\,\text{Subst}\left(\int \frac{\text{PolyLog}(3,x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^2}$$

$$= -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} - \frac{8b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{12ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{24b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{24ib^4\,\text{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{24ib^4\,\text{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 575 vs. 2(270) = 540.

Time = 2.32 (sec) , antiderivative size = 575, normalized size of antiderivative = 2.13

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx$$
$$= \frac{-\frac{a^4}{c+dx}-4a^3b\left(\frac{\arcsin(c+dx)}{c+dx}+\log\left(\frac{1}{2}(c+dx)\csc\left(\frac{1}{2}\arcsin(c+dx)\right)\right)-\log\left(\sin\left(\frac{1}{2}\arcsin(c+dx)\right)\right)\right)+6a^2b^2\left(\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^2,x]
```

```
[Out] (-(a^4/(c + d*x)) - 4*a^3*b*(ArcSin[c + d*x]/(c + d*x) + Log[((c + d*x)*Csc
[ArcSin[c + d*x]/2])/2] - Log[Sin[ArcSin[c + d*x]/2]]) + 6*a^2*b^2*(ArcSin[
c + d*x]*(-(ArcSin[c + d*x]/(c + d*x)) + 2*Log[1 - E^(I*ArcSin[c + d*x])] -
 2*Log[1 + E^(I*ArcSin[c + d*x])]) + (2*I)*PolyLog[2, -E^(I*ArcSin[c + d*x]
)] - (2*I)*PolyLog[2, E^(I*ArcSin[c + d*x])]) + 4*a*b^3*(-(ArcSin[c + d*x]^
3/(c + d*x)) + 3*ArcSin[c + d*x]^2*Log[1 - E^(I*ArcSin[c + d*x])] - 3*ArcSi
n[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x])] + (6*I)*ArcSin[c + d*x]*PolyLog
[2, -E^(I*ArcSin[c + d*x])] - (6*I)*ArcSin[c + d*x]*PolyLog[2, E^(I*ArcSin[
c + d*x])] - 6*PolyLog[3, -E^(I*ArcSin[c + d*x])] + 6*PolyLog[3, E^(I*ArcSi
n[c + d*x])]) + b^4*((-1/2*I)*Pi^4 + I*ArcSin[c + d*x]^4 - ArcSin[c + d*x]^
4/(c + d*x) + 4*ArcSin[c + d*x]^3*Log[1 - E^((-I)*ArcSin[c + d*x])] - 4*Arc
Sin[c + d*x]^3*Log[1 + E^(I*ArcSin[c + d*x])] + (12*I)*ArcSin[c + d*x]^2*Po
lyLog[2, E^((-I)*ArcSin[c + d*x])] + (12*I)*ArcSin[c + d*x]^2*PolyLog[2, -E
^(I*ArcSin[c + d*x])] + 24*ArcSin[c + d*x]*PolyLog[3, E^((-I)*ArcSin[c + d*
x])] - 24*ArcSin[c + d*x]*PolyLog[3, -E^(I*ArcSin[c + d*x])] - (24*I)*PolyL
og[4, E^((-I)*ArcSin[c + d*x])] - (24*I)*PolyLog[4, -E^(I*ArcSin[c + d*x])]
))/(d*e^2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 720 vs. 2(336) = 672.

Time = 0.91 (sec) , antiderivative size = 721, normalized size of antiderivative = 2.67

method	result
derivativedivides	$-\frac{a^4}{e^2(dx+c)}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)\right.}{}$
default	$-\frac{a^4}{e^2(dx+c)}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)\right.}{}$
parts	$-\frac{a^4}{e^2(dx+c)d}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c\right.\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-a^4/e^2/(d*x+c)+b^4/e^2*(-1/(d*x+c)*arcsin(d*x+c)^4-4*arcsin(d*x+c)^3
*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*arcsin(d*x+c)^3*ln(1-I*(d*x+c)-(1-(d
*x+c)^2)^(1/2))-24*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+
24*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+12*I*arcsin(d*x+c
)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-12*I*arcsin(d*x+c)^2*polylog(
2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-24*I*polylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1
/2))+24*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+4*a*b^3/e^2*(-1/(d*x+c)
*arcsin(d*x+c)^3+3*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*I*
arcsin(d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*polylog(3,I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))-3*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)+6*I*arcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*polylog(3,-
I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e^2*(-arcsin(d*x+c)^2/(d*x+c)+2*a
rcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*arcsin(d*x+c)*ln(1+I*(d*
x+c)+(1-(d*x+c)^2)^(1/2))+2*I*dilog(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*di
log(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+4*a^3*b/e^2*(-1/(d*x+c)*arcsin(d*x+c)
-arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx=\int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="fricas")
```

```
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^2*e^2*x^2 + 2*c*d*e^2*x
+ c^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \frac{\int \frac{a^4}{c^2+2cdx+d^2x^2}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{4a^3b\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**2,x)
```

```
[Out] (Integral(a**4/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**4*asin(c + d*
x)**4/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(4*a*b**3*asin(c + d*x)**3
/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(6*a**2*b**2*asin(c + d*x)**2/(
c**2 + 2*c*d*x + d**2*x**2), x) + Integral(4*a**3*b*asin(c + d*x)/(c**2 + 2
*c*d*x + d**2*x**2), x))/e**2
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^2,x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^2, x)
```

3.212 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 198

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} + \frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{6ib^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de^3} + \frac{3b^4\,\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de^3}$$

```
[Out] -2*I*b*(a+b*arcsin(d*x+c))^3/d/e^3-1/2*(a+b*arcsin(d*x+c))^4/d/e^3/(d*x+c)^
2+6*b^2*(a+b*arcsin(d*x+c))^2*ln(1-(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3
-6*I*b^3*(a+b*arcsin(d*x+c))*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d
/e^3+3*b^4*polylog(3,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3-2*b*(a+b*arcs
in(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4889, 12, 4723, 4771, 4721, 3798, 2221, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = -\frac{6ib^3\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^3} + \frac{6b^2\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^3} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} - \frac{2ib(a+b\arcsin(c+dx))^3}{de^3} - \frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} + \frac{3b^4\,\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de^3}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^3,x]
```

```
[Out] ((-2*I)*b*(a + b*ArcSin[c + d*x])^3)/(d*e^3) - (2*b*Sqrt[1 - (c + d*x)^2]*(
a + b*ArcSin[c + d*x])^3)/(d*e^3*(c + d*x)) - (a + b*ArcSin[c + d*x])^4/(2*
d*e^3*(c + d*x)^2) + (6*b^2*(a + b*ArcSin[c + d*x])^2*Log[1 - E^((2*I)*ArcS
in[c + d*x])])/(d*e^3) - ((6*I)*b^3*(a + b*ArcSin[c + d*x])*PolyLog[2, E^((
2*I)*ArcSin[c + d*x])])/(d*e^3) + (3*b^4*PolyLog[3, E^((2*I)*ArcSin[c + d*x
])])/(d*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{e^3x^3}\,dx,x,c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{x^3}\,dx,x,c+dx\right)}{de^3}\\
&= -\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2}+\frac{(2b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x^2\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de^3}\\
&= -\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)}-\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2}\\
&\quad+\frac{(6b^2)\,\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x}\,dx,x,c+dx\right)}{de^3}\\
&= -\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)}-\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2}\\
&\quad+\frac{(6b^2)\,\text{Subst}\left(\int (a+bx)^2\cot(x)\,dx,x,\arcsin(c+dx)\right)}{de^3}\\
&= -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3}-\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)}\\
&\quad-\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2}-\frac{(12ib^2)\,\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx,x,\arcsin(c+dx)\right)}{de^3}\\
&= -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3}-\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)}\\
&\quad-\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2}+\frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3}\\
&\quad-\frac{(12b^3)\,\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^3}
\end{aligned}$$

$$= -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} + \frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{6ib^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de^3} + \frac{(6ib^4)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^3}$$

$$= -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} + \frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{6ib^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de^3} + \frac{(3b^4)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(c+dx)}\right)}{de^3}$$

$$= -\frac{2ib(a+b\arcsin(c+dx))^3}{de^3} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} + \frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} - \frac{6ib^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de^3} + \frac{3b^4\,\text{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de^3}$$

Mathematica [A] (verified)

Time = 1.87 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.94

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \frac{-\frac{2a^4}{(c+dx)^2} - \frac{8a^3b\sqrt{1-(c+dx)^2}}{c+dx} - \frac{8a^3b\arcsin(c+dx)}{(c+dx)^2} - \frac{2b^4\arcsin(c+dx)^4}{(c+dx)^2} + 24a^2b^2\left(-\frac{\sqrt{1-(c+dx)^2}\arcsin(c+dx)}{c+dx} - \frac{\arcsin(c+dx)^2}{2(c+dx)^2} \right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^3,x]
```

```
[Out] ((-2*a^4)/(c + d*x)^2 - (8*a^3*b*Sqrt[1 - (c + d*x)^2])/(c + d*x) - (8*a^3*
b*ArcSin[c + d*x])/(c + d*x)^2 - (2*b^4*ArcSin[c + d*x]^4)/(c + d*x)^2 + 24
*a^2*b^2*(-((Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x])/(c + d*x)) - ArcSin[c +
 d*x]^2/(2*(c + d*x)^2) + Log[c + d*x]) + 8*a*b^3*((-3*Sqrt[1 - (c + d*x)^2
]*ArcSin[c + d*x]^2)/(c + d*x) - ArcSin[c + d*x]^3/(c + d*x)^2 + 6*ArcSin[c
```

```
+ d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] - (3*I)*(ArcSin[c + d*x]^2 + Pol
yLog[2, E^((2*I)*ArcSin[c + d*x])])) + b^4*((-I)*Pi^3 + (8*I)*ArcSin[c + d*
x]^3 - (8*Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x]^3)/(c + d*x) + 24*ArcSin[c
+ d*x]^2*Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (24*I)*ArcSin[c + d*x]*PolyL
og[2, E^((-2*I)*ArcSin[c + d*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[c + d*x]
)]))/(4*d*e^3)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 592 vs. $2(228) = 456$.

Time = 1.07 (sec) , antiderivative size = 593, normalized size of antiderivative = 2.99

method	result
derivativedivides	$-\frac{a^4}{2e^3(dx+c)^2}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx+c)^2\ln\left(1+\right.\right.}{}$
default	$-\frac{a^4}{2e^3(dx+c)^2}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx+c)^2\ln\left(1+\right.\right.}{}$
parts	$-\frac{a^4}{2e^3(dx+c)^2d}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/2*a^4/e^3/(d*x+c)^2+b^4/e^3*(-1/2*arcsin(d*x+c)^3*(-4*I*(d*x+c)^2+4
*(d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2-4*I*arcsin(d*x+c)^3+6
*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-12*I*arcsin(d*x+c)*pol
ylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+12*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2
)^(1/2))+6*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-12*I*arcsin(
d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+12*polylog(3,I*(d*x+c)+(1-(
d*x+c)^2)^(1/2)))+4*a*b^3/e^3*(-1/2*arcsin(d*x+c)^2*(-3*I*(d*x+c)^2+3*(d*x+
c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2+3*arcsin(d*x+c)*ln(1-I*(d*x
+c)-(1-(d*x+c)^2)^(1/2))+3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)-3*I*arcsin(d*x+c)^2-3*I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-3*I*poly
log(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e^3*(-1/2*arcsin(d*x+c)^2/
(d*x+c)^2-arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+4*a^3*b/e^3*
(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^3}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="fricas")
```

```
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^3*e^3*x^3 + 3*c*d^2*e^3*
x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \frac{\int \frac{a^4}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx +}{e^3}$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**3,x)
```

```
[Out] (Integral(a**4/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(b**4*asin(c + d*x)**4/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x
) + Integral(4*a*b**3*asin(c + d*x)**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 +
 d**3*x**3), x) + Integral(6*a**2*b**2*asin(c + d*x)**2/(c**3 + 3*c**2*d*x
+ 3*c*d**2*x**2 + d**3*x**3), x) + Integral(4*a**3*b*asin(c + d*x)/(c**3 +
3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/e**3
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx=\int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^3}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^3}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^3,x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^3, x)
```

3.213 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 439

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = &-\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} \\ &-\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} \\ &-\frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} \\ &-\frac{8b^3(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} \\ &-\frac{4b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} \\ &+\frac{4ib^4\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &+\frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &-\frac{4ib^4\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} \\ &-\frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} \\ &-\frac{4b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &+\frac{4b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} \\ &-\frac{4ib^4\,\text{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^4} \\ &+\frac{4ib^4\,\text{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^4}\end{aligned}$$

```
[Out] -2*b^2*(a+b*arcsin(d*x+c))^2/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^4/d/e^4/
(d*x+c)^3-8*b^3*(a+b*arcsin(d*x+c))*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/
d/e^4-4/3*b*(a+b*arcsin(d*x+c))^3*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/
e^4+4*I*b^4*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4+2*I*b^2*(a+b*ar
csin(d*x+c))^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-4*I*b^4*poly
log(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-2*I*b^2*(a+b*arcsin(d*x+c))^2*po
lylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-4*b^3*(a+b*arcsin(d*x+c))*poly
log(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4+4*b^3*(a+b*arcsin(d*x+c))*polyl
og(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-4*I*b^4*polylog(4,-I*(d*x+c)-(1-(
d*x+c)^2)^(1/2))/d/e^4+4*I*b^4*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e
^4-2/3*b*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)^2
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 439, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.522$, Rules used = {4889, 12, 4723, 4789, 4803, 4268, 2611, 6744, 2320, 6724, 2317, 2438}

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = -\frac{8b^3\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^4} - \frac{4b\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3}{3de^4} - \frac{4b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^4} + \frac{4b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^4} + \frac{2ib^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^4} - \frac{2ib^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de^4} - \frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} + \frac{4ib^4\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4ib^4\operatorname{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^4}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^4,x]
```

```
[Out] (-2*b^2*(a + b*ArcSin[c + d*x])^2)/(d*e^4*(c + d*x)) - (2*b*Sqrt[1 - (c + d
*x)^2]*(a + b*ArcSin[c + d*x])^3)/(3*d*e^4*(c + d*x)^2) - (a + b*ArcSin[c +
 d*x])^4/(3*d*e^4*(c + d*x)^3) - (8*b^3*(a + b*ArcSin[c + d*x])*ArcTanh[E^(
I*ArcSin[c + d*x])])/(d*e^4) - (4*b*(a + b*ArcSin[c + d*x])^3*ArcTanh[E^(I*
ArcSin[c + d*x])])/(3*d*e^4) + ((4*I)*b^4*PolyLog[2, -E^(I*ArcSin[c + d*x])
])/(d*e^4) + ((2*I)*b^2*(a + b*ArcSin[c + d*x])^2*PolyLog[2, -E^(I*ArcSin[c
 + d*x])])/(d*e^4) - ((4*I)*b^4*PolyLog[2, E^(I*ArcSin[c + d*x])])/(d*e^4)
- ((2*I)*b^2*(a + b*ArcSin[c + d*x])^2*PolyLog[2, E^(I*ArcSin[c + d*x])])/(
d*e^4) - (4*b^3*(a + b*ArcSin[c + d*x])*PolyLog[3, -E^(I*ArcSin[c + d*x])])
/(d*e^4) + (4*b^3*(a + b*ArcSin[c + d*x])*PolyLog[3, E^(I*ArcSin[c + d*x])]
)/(d*e^4) - ((4*I)*b^4*PolyLog[4, -E^(I*ArcSin[c + d*x])])/(d*e^4) + ((4*I)
*b^4*PolyLog[4, E^(I*ArcSin[c + d*x])])/(d*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{e^4x^4}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{x^4}\,dx, x, c+dx\right)}{de^4}\\
&= -\frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} + \frac{(4b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x^3\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^4}\\
&= -\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3}\\
&\quad + \frac{(2b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^4}\\
&\quad + \frac{(2b^2)\,\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x^2}\,dx, x, c+dx\right)}{de^4}\\
&= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2}\\
&\quad - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} + \frac{(2b)\text{Subst}\left(\int (a+bx)^3\csc(x)\,dx, x, \arcsin(c+dx)\right)}{3de^4}\\
&\quad + \frac{(4b^3)\,\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de^4}\\
&= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2}\\
&\quad - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{4b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4}\\
&\quad - \frac{(2b^2)\,\text{Subst}\left(\int (a+bx)^2\log\left(1-e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^4}\\
&\quad + \frac{(2b^2)\,\text{Subst}\left(\int (a+bx)^2\log\left(1+e^{ix}\right)\,dx, x, \arcsin(c+dx)\right)}{de^4}\\
&\quad + \frac{(4b^3)\,\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(c+dx)\right)}{de^4}
\end{aligned}$$

$$= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{8b^3(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{(4ib^3)\,\text{Subst}\left(\int(a+bx)\,\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} + \frac{(4ib^3)\,\text{Subst}\left(\int(a+bx)\,\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} - \frac{(4b^4)\,\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} + \frac{(4b^4)\,\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4}$$

$$= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{8b^3(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{2ib^2(a+b\arcsin(c+dx))^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4b^3(a+b\arcsin(c+dx))\,\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{(4ib^4)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{(4ib^4)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{(4b^4)\,\text{Subst}\left(\int\text{PolyLog}\left(3,-e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4} - \frac{(4b^4)\,\text{Subst}\left(\int\text{PolyLog}\left(3,e^{ix}\right)\,dx,x,\arcsin(c+dx)\right)}{de^4}$$

$$= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{8b^3(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b(a+b\arcsin(c+dx))^3\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{4ib^4\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{2ib^2(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{2ib^2(a+b\arcsin(c+dx))^2\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b^3(a+b\arcsin(c+dx))\text{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4b^3(a+b\arcsin(c+dx))\text{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{(4ib^4)\text{Subst}\left(\int\frac{\text{PolyLog}(3,-x)}{x}dx,x,e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{(4ib^4)\text{Subst}\left(\int\frac{\text{PolyLog}(3,x)}{x}dx,x,e^{i\arcsin(c+dx)}\right)}{de^4}$$

$$= -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{8b^3(a+b\arcsin(c+dx))\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b(a+b\arcsin(c+dx))^3\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{4ib^4\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{2ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{2ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4ib^4\operatorname{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^4}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1274 vs. 2(439) = 878.

Time = 11.49 (sec) , antiderivative size = 1274, normalized size of antiderivative = 2.90

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = -\frac{a^4}{3de^4(c+dx)^3} + \frac{a^2b^2\left(8i\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right) - \frac{2(2+4\arcsin(c+dx)^2-2\cos(2\arcsin(c+dx))-3(c+dx)\arcsin(c+dx)\log(1-e^{i\arcsin(c+dx)}}{}\right.}{} + \frac{ab^3\left(-24\arcsin(c+dx)\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 4\arcsin(c+dx)^3\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 6\arcsin(c+\right.}{} + \frac{b^4\left(-2i\pi^4 + 4i\arcsin(c+dx)^4 - 24\arcsin(c+dx)^2\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 2\arcsin(c+dx)^4\cot\left(\frac{1}{2}\mathrm{arc}\right.\right.}{} + \frac{4a^3b\left(-\frac{1}{12}\arcsin(c+dx)\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - \frac{1}{24}\csc^2\left(\frac{1}{2}\arcsin(c+dx)\right) - \frac{1}{24}\arcsin(c+dx)\cot\left(\frac{1}{2}\mathrm{a}\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^4,x]
```

```
[Out] -1/3*a^4/(d*e^4*(c + d*x)^3) + (a^2*b^2*((8*I)*PolyLog[2, -E^(I*ArcSin[c +
d*x])] - (2*(2 + 4*ArcSin[c + d*x]^2 - 2*Cos[2*ArcSin[c + d*x]] - 3*(c + d*
```

```
x)*ArcSin[c + d*x]*Log[1 - E^(I*ArcSin[c + d*x])] + 3*(c + d*x)*ArcSin[c +
d*x]*Log[1 + E^(I*ArcSin[c + d*x])] + (4*I)*(c + d*x)^3*PolyLog[2, E^(I*Arc
Sin[c + d*x])] + 2*ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] + ArcSin[c + d*x]
*Log[1 - E^(I*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]] - ArcSin[c + d*x]*Lo
g[1 + E^(I*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]]))/(c + d*x)^3))/(4*d*e^
4) + (a*b^3*(-24*ArcSin[c + d*x]*Cot[ArcSin[c + d*x]/2] - 4*ArcSin[c + d*x]
^3*Cot[ArcSin[c + d*x]/2] - 6*ArcSin[c + d*x]^2*Csc[ArcSin[c + d*x]/2]^2 -
(c + d*x)*ArcSin[c + d*x]^3*Csc[ArcSin[c + d*x]/2]^4 + 24*ArcSin[c + d*x]^2
*Log[1 - E^(I*ArcSin[c + d*x])] - 24*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[
c + d*x])] + 48*Log[Tan[ArcSin[c + d*x]/2]] + (48*I)*ArcSin[c + d*x]*PolyLo
g[2, -E^(I*ArcSin[c + d*x])] - (48*I)*ArcSin[c + d*x]*PolyLog[2, E^(I*ArcSi
n[c + d*x])] - 48*PolyLog[3, -E^(I*ArcSin[c + d*x])] + 48*PolyLog[3, E^(I*A
rcSin[c + d*x])] + 6*ArcSin[c + d*x]^2*Sec[ArcSin[c + d*x]/2]^2 - (16*ArcSi
n[c + d*x]^3*Sin[ArcSin[c + d*x]/2]^4)/(c + d*x)^3 - 24*ArcSin[c + d*x]*Tan
[ArcSin[c + d*x]/2] - 4*ArcSin[c + d*x]^3*Tan[ArcSin[c + d*x]/2]))/(12*d*e^
4) + (b^4*((-2*I)*Pi^4 + (4*I)*ArcSin[c + d*x]^4 - 24*ArcSin[c + d*x]^2*Cot
[ArcSin[c + d*x]/2] - 2*ArcSin[c + d*x]^4*Cot[ArcSin[c + d*x]/2] - 4*ArcSin
[c + d*x]^3*Csc[ArcSin[c + d*x]/2]^2 - ((c + d*x)*ArcSin[c + d*x]^4*Csc[Arc
Sin[c + d*x]/2]^4)/2 + 16*ArcSin[c + d*x]^3*Log[1 - E^((-I)*ArcSin[c + d*x]
)] + 96*ArcSin[c + d*x]*Log[1 - E^(I*ArcSin[c + d*x])] - 96*ArcSin[c + d*x]
*Log[1 + E^(I*ArcSin[c + d*x])] - 16*ArcSin[c + d*x]^3*Log[1 + E^(I*ArcSin[
c + d*x])] + (48*I)*ArcSin[c + d*x]^2*PolyLog[2, E^((-I)*ArcSin[c + d*x])]
+ (48*I)*(2 + ArcSin[c + d*x]^2)*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (96*I
)*PolyLog[2, E^(I*ArcSin[c + d*x])] + 96*ArcSin[c + d*x]*PolyLog[3, E^((-I)
*ArcSin[c + d*x])] - 96*ArcSin[c + d*x]*PolyLog[3, -E^(I*ArcSin[c + d*x])]
- (96*I)*PolyLog[4, E^((-I)*ArcSin[c + d*x])] - (96*I)*PolyLog[4, -E^(I*Arc
Sin[c + d*x])] + 4*ArcSin[c + d*x]^3*Sec[ArcSin[c + d*x]/2]^2 - (8*ArcSin[c
 + d*x]^4*Sin[ArcSin[c + d*x]/2]^4)/(c + d*x)^3 - 24*ArcSin[c + d*x]^2*Tan[
ArcSin[c + d*x]/2] - 2*ArcSin[c + d*x]^4*Tan[ArcSin[c + d*x]/2]))/(24*d*e^4
) + (4*a^3*b*(-1/12*(ArcSin[c + d*x]*Cot[ArcSin[c + d*x]/2]) - Csc[ArcSin[c
 + d*x]/2]^2/24 - (ArcSin[c + d*x]*Cot[ArcSin[c + d*x]/2]*Csc[ArcSin[c + d*
x]/2]^2)/24 - Log[Cos[ArcSin[c + d*x]/2]]/6 + Log[Sin[ArcSin[c + d*x]/2]]/6
 + Sec[ArcSin[c + d*x]/2]^2/24 - (ArcSin[c + d*x]*Tan[ArcSin[c + d*x]/2])/1
2 - (ArcSin[c + d*x]*Sec[ArcSin[c + d*x]/2]^2*Tan[ArcSin[c + d*x]/2])/24))/
(d*e^4)
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 1009, normalized size of antiderivative = 2.30

method	result	size
derivativedivides	Expression too large to display	1009
default	Expression too large to display	1009
parts	Expression too large to display	1020

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3*a^4/e^4/(d*x+c)^3+b^4/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)^2*(2*arcs
in(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+6*(d*x+c)^2)-2/3*arcs
in(d*x+c)^3*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*I*arcsin(d*x+c)^2*polylog
(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-4*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-
(d*x+c)^2)^(1/2))-4*I*polylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+2/3*arcsin(
d*x+c)^3*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)^2*polylog(2,
I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+
c)^2)^(1/2))+4*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-4*arcsin(d*x+c)*l
n(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(
1/2))+4*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-4*I*polylog(2,I*(
d*x+c)+(1-(d*x+c)^2)^(1/2)))+4*a*b^3/e^4*(-1/6/(d*x+c)^3*arcsin(d*x+c)*(3*a
rcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+2*arcsin(d*x+c)^2+6*(d*x+c)^2)+1/2
*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*arcsin(d*x+c)*polylo
g(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))
-1/2*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+I*arcsin(d*x+c)*po
lylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^
(1/2))-2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e^4*(-1/3*(arcsi
n(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+(d*x+c)^2)/(d*x+c)^3+1
/3*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3*I*polylog(2,I*(d*x
+c)+(1-(d*x+c)^2)^(1/2))-1/3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/
2))+1/3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+4*a^3*b/e^4*(-1/3/(d*x
+c)^3*arcsin(d*x+c)-1/6/(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x
+c)^2)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="fricas")
```

```
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^4*e^4*x^4 + 4*c*d^3*e^4*
x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*e^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$$
$$= \frac{\int \frac{a^4}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{}{c^4}}{e^4}$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**4,x)
```

```
[Out] (Integral(a**4/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4
*x**4), x) + Integral(b**4*asin(c + d*x)**4/(c**4 + 4*c**3*d*x + 6*c**2*d**
2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(4*a*b**3*asin(c + d*x)**
3/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) +
Integral(6*a**2*b**2*asin(c + d*x)**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2
 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(4*a**3*b*asin(c + d*x)/(c**4 +
 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x))/e**4
```

Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^4/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1/
3*(b^4*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + 3*(d^4*e^
4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(2/3*(2*(b^
4*d*x + b^4*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1))^3 - 6*(a*b^3*d^2*x^2 + 2*a*b^3*c*d*x + a*b^
3*c^2 - a*b^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 - 9
*(a^2*b^2*d^2*x^2 + 2*a^2*b^2*c*d*x + a^2*b^2*c^2 - a^2*b^2)*arctan2(d*x +
c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 - 6*(a^3*b*d^2*x^2 + 2*a^3*b*c*d
*x + a^3*b*c^2 - a^3*b)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
1)))/(d^6*e^4*x^6 + 6*c*d^5*e^4*x^5 + (15*c^2 - 1)*d^4*e^4*x^4 + 4*(5*c^3 -
 c)*d^3*e^4*x^3 + 3*(5*c^4 - 2*c^2)*d^2*e^4*x^2 + 2*(3*c^5 - 2*c^3)*d*e^4*x
 + (c^6 - c^4)*e^4), x))/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x +
 c^3*d*e^4)
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^4}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^4,x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^4, x)
```

3.214 $\int (a+b\arcsin(c+dx))^5\,dx$

Optimal result

Integrand size = 12, antiderivative size = 164

$$\int (a+b\arcsin(c+dx))^5\,dx = 120ab^4x+\frac{120b^5\sqrt{1-(c+dx)^2}}{d}+\frac{120b^5(c+dx)\arcsin(c+dx)}{d}-\frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}-\frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d}+\frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^5}{d}$$

```
[Out] 120*a*b^4*x+120*b^5*(d*x+c)*arcsin(d*x+c)/d-20*b^2*(d*x+c)*(a+b*arcsin(d*x+
c))^3/d+(d*x+c)*(a+b*arcsin(d*x+c))^5/d+120*b^5*(1-(d*x+c)^2)^(1/2)/d-60*b^
3*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+5*b*(a+b*arcsin(d*x+c))^4*(1-
(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4887, 4715, 4767, 267}

$$\int (a+b\arcsin(c+dx))^5\,dx = -\frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d} - \frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d} + 120ab^4x + \frac{120b^5(c+dx)\arcsin(c+dx)}{d} + \frac{120b^5\sqrt{1-(c+dx)^2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^5,x]
```

```
[Out] 120*a*b^4*x + (120*b^5*Sqrt[1 - (c + d*x)^2])/d + (120*b^5*(c + d*x)*ArcSin
[c + d*x])/d - (60*b^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2)/d -
 (20*b^2*(c + d*x)*(a + b*ArcSin[c + d*x])^3)/d + (5*b*Sqrt[1 - (c + d*x)^2
]*(a + b*ArcSin[c + d*x])^4)/d + ((c + d*x)*(a + b*ArcSin[c + d*x])^5)/d
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^5\,dx, x, c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d} - \frac{(5b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^4}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d}\\
&\quad - \frac{(20b^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^3\,dx, x, c+dx\right)}{d}\\
&= -\frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d} + \frac{(60b^3)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d} - \frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d}\\
&\quad + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d}\\
&\quad + \frac{(120b^4)\,\text{Subst}\left(\int (a+b\arcsin(x))\,dx, x, c+dx\right)}{d}\\
&= 120ab^4x - \frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}\\
&\quad - \frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d} + \frac{(120b^5)\,\text{Subst}\left(\int \arcsin(x)\,dx, x, c+dx\right)}{d}\\
&= 120ab^4x + \frac{120b^5(c+dx)\arcsin(c+dx)}{d} - \frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}\\
&\quad - \frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d}\\
&\quad + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d} - \frac{(120b^5)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{d}
\end{aligned}$$

$$= 120ab^4x + \frac{120b^5\sqrt{1-(c+dx)^2}}{d} + \frac{120b^5(c+dx)\arcsin(c+dx)}{d} - \frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d} - \frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^5}{d}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.91

$$\int (a+b\arcsin(c+dx))^5\,dx$$

$$= \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4 + (c+dx)(a+b\arcsin(c+dx))^5 - 20b^2\left(3b\sqrt{1-(c+dx)^2}(a+\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^5,x]
```

```
[Out] (5*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^4 + (c + d*x)*(a + b*Arc
Sin[c + d*x])^5 - 20*b^2*(3*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])
^2 + (c + d*x)*(a + b*ArcSin[c + d*x])^3 - 6*b^2*(a*(c + d*x) + b*Sqrt[1 -
(c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))/d
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 366 vs. 2(158) = 316.

Time = 0.66 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.24

method	result
derivativedivides	$\frac{(dx+c)a^5+b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-\right.}{}$
default	$\frac{(dx+c)a^5+b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-\right.}{}$
parts	$x\,a^5+\frac{b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-(d\right.}{d}$

```
[In] int((a+b*arcsin(d*x+c))^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*((d*x+c)*a^5+b^5*(arcsin(d*x+c)^5*(d*x+c)+5*arcsin(d*x+c)^4*(1-(d*x+c)^
2)^(1/2)-20*arcsin(d*x+c)^3*(d*x+c)-60*arcsin(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+
120*(1-(d*x+c)^2)^(1/2)+120*(d*x+c)*arcsin(d*x+c))+5*a*b^4*(arcsin(d*x+c)^4
```

```
*(d*x+c)+4*arcsin(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-12*arcsin(d*x+c)^2*(d*x+c)+2
4*d*x+24*c-24*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+10*a^2*b^3*(arcsin(d*x+c)^
3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-6*(1-(d*x+c)^2)^(1/2)-6*(d*
x+c)*arcsin(d*x+c))+10*a^3*b^2*(arcsin(d*x+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(
d*x+c)*(1-(d*x+c)^2)^(1/2))+5*a^4*b*((d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1
/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 323 vs. $2(158) = 316$.

Time = 0.26 (sec) , antiderivative size = 323, normalized size of antiderivative = 1.97

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$= \frac{(b^5dx+b^5c)\arcsin(dx+c)^5+5(ab^4dx+ab^4c)\arcsin(dx+c)^4+10((a^2b^3-2b^5)dx+(a^2b^3-2b^5)c)\arcs$$

```
[In] integrate((a+b*arcsin(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] ((b^5*d*x + b^5*c)*arcsin(d*x + c)^5 + 5*(a*b^4*d*x + a*b^4*c)*arcsin(d*x +
 c)^4 + 10*((a^2*b^3 - 2*b^5)*d*x + (a^2*b^3 - 2*b^5)*c)*arcsin(d*x + c)^3
+ (a^5 - 20*a^3*b^2 + 120*a*b^4)*d*x + 10*((a^3*b^2 - 6*a*b^4)*d*x + (a^3*b
^2 - 6*a*b^4)*c)*arcsin(d*x + c)^2 + 5*((a^4*b - 12*a^2*b^3 + 24*b^5)*d*x +
 (a^4*b - 12*a^2*b^3 + 24*b^5)*c)*arcsin(d*x + c) + 5*(b^5*arcsin(d*x + c)^
4 + 4*a*b^4*arcsin(d*x + c)^3 + a^4*b - 12*a^2*b^3 + 24*b^5 + 6*(a^2*b^3 -
2*b^5)*arcsin(d*x + c)^2 + 4*(a^3*b^2 - 6*a*b^4)*arcsin(d*x + c))*sqrt(-d^2
*x^2 - 2*c*d*x - c^2 + 1))/d
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 663 vs. $2(146) = 292$.

Time = 0.41 (sec) , antiderivative size = 663, normalized size of antiderivative = 4.04

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$= \begin{cases} a^5x+\frac{5a^4bc\operatorname{asin}(c+dx)}{d}+5a^4bx\operatorname{asin}(c+dx)+\frac{5a^4b\sqrt{-c^2-2cdx-d^2x^2+1}}{d}+\frac{10a^3b^2c\operatorname{asin}^2(c+dx)}{d}+10a^3b^2x\operatorname{asin}^2(c+ \\ x(a+b\operatorname{asin}(c))^5 \end{cases}$$

```
[In] integrate((a+b*asin(d*x+c))**5,x)
```

```
[Out] Piecewise((a**5*x + 5*a**4*b*c*asin(c + d*x)/d + 5*a**4*b*x*asin(c + d*x) +
 5*a**4*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 10*a**3*b**2*c*asin(c +
 d*x)**2/d + 10*a**3*b**2*x*asin(c + d*x)**2 - 20*a**3*b**2*x + 20*a**3*b**
```

```
2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 10*a**2*b**3*c*as
in(c + d*x)**3/d - 60*a**2*b**3*c*asin(c + d*x)/d + 10*a**2*b**3*x*asin(c +
 d*x)**3 - 60*a**2*b**3*x*asin(c + d*x) + 30*a**2*b**3*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)**2/d - 60*a**2*b**3*sqrt(-c**2 - 2*c*d*x -
d**2*x**2 + 1)/d + 5*a*b**4*c*asin(c + d*x)**4/d - 60*a*b**4*c*asin(c + d*x
)**2/d + 5*a*b**4*x*asin(c + d*x)**4 - 60*a*b**4*x*asin(c + d*x)**2 + 120*a
*b**4*x + 20*a*b**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/
d - 120*a*b**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + b**5
*c*asin(c + d*x)**5/d - 20*b**5*c*asin(c + d*x)**3/d + 120*b**5*c*asin(c +
d*x)/d + b**5*x*asin(c + d*x)**5 - 20*b**5*x*asin(c + d*x)**3 + 120*b**5*x*
asin(c + d*x) + 5*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)*
*4/d - 60*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/d + 1
20*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d, Ne(d, 0)), (x*(a + b*asin(
c))**5, True))
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^5\,dx=\int (b\arcsin(dx+c)+a)^5\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] b^5*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^5 + a^5*x + 5*
((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^4*b/d + integrate(5*
(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^5*d*x*arctan2(d*x + c, sqrt(d*x + c
 + 1)*sqrt(-d*x - c + 1))^4 + (a*b^4*d^2*x^2 + 2*a*b^4*c*d*x + a*b^4*c^2 -
a*b^4)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + 2*(a^2*b^
3*d^2*x^2 + 2*a^2*b^3*c*d*x + a^2*b^3*c^2 - a^2*b^3)*arctan2(d*x + c, sqrt(
d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 2*(a^3*b^2*d^2*x^2 + 2*a^3*b^2*c*d*x +
 a^3*b^2*c^2 - a^3*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 482 vs. 2(158) = 316.

Time = 0.30 (sec) , antiderivative size = 482, normalized size of antiderivative = 2.94

$$\int (a+b\arcsin(c+dx))^5\,dx = \frac{(dx+c)b^5\arcsin(dx+c)^5}{d} + \frac{5(dx+c)ab^4\arcsin(dx+c)^4}{d} + \frac{5\sqrt{-(dx+c)^2+1}b^5\arcsin(dx+c)^4}{d} + \frac{10(dx+c)a^2b^3\arcsin(dx+c)^3}{d} - \frac{20(dx+c)b^5\arcsin(dx+c)^3}{d} + \frac{20\sqrt{-(dx+c)^2+1}ab^4\arcsin(dx+c)^3}{d} + \frac{10(dx+c)a^3b^2\arcsin(dx+c)^2}{d} - \frac{60(dx+c)ab^4\arcsin(dx+c)^2}{d} + \frac{30\sqrt{-(dx+c)^2+1}a^2b^3\arcsin(dx+c)^2}{d} - \frac{60\sqrt{-(dx+c)^2+1}b^5\arcsin(dx+c)^2}{d} + \frac{5(dx+c)a^4b\arcsin(dx+c)}{d} - \frac{60(dx+c)a^2b^3\arcsin(dx+c)}{d} + \frac{120(dx+c)b^5\arcsin(dx+c)}{d} + \frac{20\sqrt{-(dx+c)^2+1}a^3b^2\arcsin(dx+c)}{d} - \frac{120\sqrt{-(dx+c)^2+1}ab^4\arcsin(dx+c)}{d} + \frac{(dx+c)a^5}{d} - \frac{20(dx+c)a^3b^2}{d} + \frac{120(dx+c)ab^4}{d} + \frac{5\sqrt{-(dx+c)^2+1}a^4b}{d} - \frac{60\sqrt{-(dx+c)^2+1}a^2b^3}{d} + \frac{120\sqrt{-(dx+c)^2+1}b^5}{d}$$

```
[In] integrate((a+b*arcsin(d*x+c))^5,x, algorithm="giac")
```

```
[Out] (d*x + c)*b^5*arcsin(d*x + c)^5/d + 5*(d*x + c)*a*b^4*arcsin(d*x + c)^4/d +
 5*sqrt(-(d*x + c)^2 + 1)*b^5*arcsin(d*x + c)^4/d + 10*(d*x + c)*a^2*b^3*ar
csin(d*x + c)^3/d - 20*(d*x + c)*b^5*arcsin(d*x + c)^3/d + 20*sqrt(-(d*x +
c)^2 + 1)*a*b^4*arcsin(d*x + c)^3/d + 10*(d*x + c)*a^3*b^2*arcsin(d*x + c)^
2/d - 60*(d*x + c)*a*b^4*arcsin(d*x + c)^2/d + 30*sqrt(-(d*x + c)^2 + 1)*a^
2*b^3*arcsin(d*x + c)^2/d - 60*sqrt(-(d*x + c)^2 + 1)*b^5*arcsin(d*x + c)^2
/d + 5*(d*x + c)*a^4*b*arcsin(d*x + c)/d - 60*(d*x + c)*a^2*b^3*arcsin(d*x
+ c)/d + 120*(d*x + c)*b^5*arcsin(d*x + c)/d + 20*sqrt(-(d*x + c)^2 + 1)*a^
3*b^2*arcsin(d*x + c)/d - 120*sqrt(-(d*x + c)^2 + 1)*a*b^4*arcsin(d*x + c)/
d + (d*x + c)*a^5/d - 20*(d*x + c)*a^3*b^2/d + 120*(d*x + c)*a*b^4/d + 5*sq
rt(-(d*x + c)^2 + 1)*a^4*b/d - 60*sqrt(-(d*x + c)^2 + 1)*a^2*b^3/d + 120*sq
rt(-(d*x + c)^2 + 1)*b^5/d
```

Mupad [B] (verification not implemented)

Time = 0.70 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.93

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$= a^5 x + \frac{10 a^3 b^2 \left(2 \operatorname{asin}(c+d x) \sqrt{1-(c+d x)^2}+\left(\operatorname{asin}(c+d x)^2-2\right) (c+d x)\right)}{d}$$
$$+ \frac{5 a^4 b \left(\sqrt{1-(c+d x)^2}+\operatorname{asin}(c+d x) (c+d x)\right)}{d}$$
$$+ \frac{b^5 (c+d x) \left(\operatorname{asin}(c+d x)^5-20 \operatorname{asin}(c+d x)^3+120 \operatorname{asin}(c+d x)\right)}{d}$$
$$+ \frac{b^5 \sqrt{1-(c+d x)^2} \left(5 \operatorname{asin}(c+d x)^4-60 \operatorname{asin}(c+d x)^2+120\right)}{d}$$
$$+ \frac{5 a b^4 (c+d x) \left(\operatorname{asin}(c+d x)^4-12 \operatorname{asin}(c+d x)^2+24\right)}{d}$$
$$+ \frac{10 a^2 b^3 \left(3 \operatorname{asin}(c+d x)^2-6\right) \sqrt{1-(c+d x)^2}}{d}$$
$$- \frac{10 a^2 b^3 \left(6 \operatorname{asin}(c+d x)-\operatorname{asin}(c+d x)^3\right) (c+d x)}{d}$$
$$- \frac{5 a b^4 \left(24 \operatorname{asin}(c+d x)-4 \operatorname{asin}(c+d x)^3\right) \sqrt{1-(c+d x)^2}}{d}$$

```
[In] int((a + b*asin(c + d*x))^5,x)
```

```
[Out] a^5*x + (10*a^3*b^2*(2*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d*
x)^2 - 2)*(c + d*x)))/d + (5*a^4*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*x)
```

```
*(c + d*x)))/d + (b^5*(c + d*x)*(120*asin(c + d*x) - 20*asin(c + d*x)^3 + a
sin(c + d*x)^5))/d + (b^5*(1 - (c + d*x)^2)^(1/2)*(5*asin(c + d*x)^4 - 60*a
sin(c + d*x)^2 + 120))/d + (5*a*b^4*(c + d*x)*(asin(c + d*x)^4 - 12*asin(c
+ d*x)^2 + 24))/d + (10*a^2*b^3*(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x)^2)^(
1/2))/d - (10*a^2*b^3*(6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))/d - (5
*a*b^4*(24*asin(c + d*x) - 4*asin(c + d*x)^3)*(1 - (c + d*x)^2)^(1/2))/d
```

3.215 $\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 213

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd}$$

```
[Out] 1/8*e^4*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d-3/16*e^4*Ci(3*(a+b*arcsin(d*
x+c))/b)*cos(3*a/b)/b/d+1/16*e^4*Ci(5*(a+b*arcsin(d*x+c))/b)*cos(5*a/b)/b/d
+1/8*e^4*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b/d-3/16*e^4*Si(3*(a+b*arcsin(d
*x+c))/b)*sin(3*a/b)/b/d+1/16*e^4*Si(5*(a+b*arcsin(d*x+c))/b)*sin(5*a/b)/b/
d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4889, 12, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd}$$

```
[In] Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^4*Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/(8*b*d) - (3*e^4*Cos[
(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/(16*b*d) + (e^4*Cos[(5
*a)/b]*CosIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/(16*b*d) + (e^4*Sin[a/b]
*SinIntegral[(a + b*ArcSin[c + d*x])/b])/(8*b*d) - (3*e^4*Sin[(3*a)/b]*SinI
ntegral[(3*(a + b*ArcSin[c + d*x]))/b])/(16*b*d) + (e^4*Sin[(5*a)/b]*SinInt
egral[(5*(a + b*ArcSin[c + d*x]))/b])/(16*b*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^4x^4}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{x^4}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^4\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16bd}\\
&\quad+\frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{(3e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16bd}
\end{aligned}
$$

$$= \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd} - \frac{\left(3e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd} + \frac{\left(e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd} + \frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd} - \frac{\left(3e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd} + \frac{\left(e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}$$

$$= \frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd}$$

Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.70

$$\int\frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\left(2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)+\cos\left(\frac{5a}{b}\right)\text{C}\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^4*(2*Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - 3*Cos[(3*a)/b]*CosInt
egral[3*(a/b + ArcSin[c + d*x])] + Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin
[c + d*x])] + 2*Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] - 3*Sin[(3*a)/b
]*SinIntegral[3*(a/b + ArcSin[c + d*x])] + Sin[(5*a)/b]*SinIntegral[5*(a/b
+ ArcSin[c + d*x])]))/(16*b*d)
```

Maple [A] (verified)

Time = 0.28 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.72

method	result
derivativedivides	$\frac{e^4\left(\mathrm{Ci}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)+\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+2\,\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+2\,\mathrm{Ci}\left(\arcsin(dx-\right.\right.}{16db}$
default	$\frac{e^4\left(\mathrm{Ci}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)+\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+2\,\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+2\,\mathrm{Ci}\left(\arcsin(dx-\right.\right.}{16db}$

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/d*e^4*(Ci(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)+Si(5*arcsin(d*x+c)+5*a/b)*
sin(5*a/b)+2*Si(arcsin(d*x+c)+a/b)*sin(a/b)+2*Ci(arcsin(d*x+c)+a/b)*cos(a/b
)-3*Si(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)-3*Ci(3*arcsin(d*x+c)+3*a/b)*cos(3*
a/b))/b
```

Fricas [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^4}{b\arcsin\left(dx+c\right)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x
 + c^4*e^4)/(b*arcsin(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx=e^4\left(\int \frac{c^4}{a+b\,\mathrm{asin}\,(c+dx)}\,dx+\int \frac{d^4x^4}{a+b\,\mathrm{asin}\,(c+dx)}\,dx+\int \frac{4cd^3x^3}{a+b\,\mathrm{asin}\,(c+dx)}\,dx+\int \frac{6c^2d^2x^2}{a+b\,\mathrm{asin}\,(c+dx)}\,dx+\int \frac{4c^3dx}{a+b\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c)),x)
```

```
[Out] e**4*(Integral(c**4/(a + b*asin(c + d*x)), x) + Integral(d**4*x**4/(a + b*a
sin(c + d*x)), x) + Integral(4*c*d**3*x**3/(a + b*asin(c + d*x)), x) + Inte
gral(6*c**2*d**2*x**2/(a + b*asin(c + d*x)), x) + Integral(4*c**3*d*x/(a +
b*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^4}{b\arcsin\left(dx+c\right)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 419 vs. $2(201) = 402$.

Time = 0.35 (sec) , antiderivative size = 419, normalized size of antiderivative = 1.97

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\cos\left(\frac{a}{b}\right)^5\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{bd} + \frac{e^4\cos\left(\frac{a}{b}\right)^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{bd} - \frac{5\,e^4\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{4\,bd} - \frac{3\,e^4\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{4\,bd} - \frac{3\,e^4\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{4\,bd} - \frac{3\,e^4\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{4\,bd} + \frac{5\,e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{16\,bd} + \frac{9\,e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{16\,bd} + \frac{e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(dx+c\right)\right)}{8\,bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(dx+c\right)\right)}{16\,bd} + \frac{3\,e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{16\,bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(dx+c\right)\right)}{8\,bd}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] e^4*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) + e^4*cos(a/b)
^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 5/4*e^4*cos(a/b
)^3*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^3*cos_
integral(3*a/b + 3*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^2*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^2*sin(a/b)*si
n_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 5/16*e^4*cos(a/b)*cos_integra
l(5*a/b + 5*arcsin(d*x + c))/(b*d) + 9/16*e^4*cos(a/b)*cos_integral(3*a/b +
 3*arcsin(d*x + c))/(b*d) + 1/8*e^4*cos(a/b)*cos_integral(a/b + arcsin(d*x
+ c))/(b*d) + 1/16*e^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b*
d) + 3/16*e^4*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 1/8*
e^4*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^4}{a+b\,\mathrm{asin}\left(c+d\,x\right)} \,d x$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x)), x)
```

3.216 $\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 145

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = -\frac{e^3\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{4bd} + \frac{e^3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8bd} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4bd} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8bd}$$

```
[Out] 1/4*e^3*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b/d-1/8*e^3*cos(4*a/b)*Si(4*
(a+b*arcsin(d*x+c))/b)/b/d-1/4*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*sin(2*a/b)/b
/d+1/8*e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{4889, 12, 4731, 4491, 3384, 3380, 3383\}$

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = -\frac{e^3\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4bd} + \frac{e^3\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8bd} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4bd} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8bd}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] -1/4*(e^3*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b])/(b*d) +
(e^3*CosIntegral[(4*(a + b*ArcSin[c + d*x]))/b]*Sin[(4*a)/b])/(8*b*d) + (e^
3*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(4*b*d) - (e^3*C
os[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/(8*b*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^3x^3}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int \frac{x^3}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= -\frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{bd}\\
&= -\frac{e^3\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^3\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{e^3\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd}\\
&= \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad-\frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad+\frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}
\end{aligned}
$$

$$= -\frac{e^3 \operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{4bd} + \frac{e^3 \operatorname{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8bd} + \frac{e^3\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4bd} - \frac{e^3\cos\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8bd}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.75

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \frac{e^3\left(-2\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right)+\operatorname{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{4a}{b}\right)+2\,\mathrm{co}\right.}{8bd}$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^3*(-2*CosIntegral[2*(a/b + ArcSin[c + d*x])]*Sin[(2*a)/b] + CosIntegral[
4*(a/b + ArcSin[c + d*x])]*Sin[(4*a)/b] + 2*Cos[(2*a)/b]*SinIntegral[2*(a/b
 + ArcSin[c + d*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x])])
)/(8*b*d)
```

Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.77

method	result
derivativedivides	$-\frac{e^3\left(\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\operatorname{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)-2\operatorname{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+2\operatorname{Ci}\left(2\,\mathrm{ar}\right.\right.}{8db}$
default	$-\frac{e^3\left(\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\operatorname{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)-2\operatorname{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+2\operatorname{Ci}\left(2\,\mathrm{ar}\right.\right.}{8db}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d*e^3*(Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)-Ci(4*arcsin(d*x+c)+4*a/b)*
sin(4*a/b)-2*Si(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)+2*Ci(2*arcsin(d*x+c)+2*a/
b)*sin(2*a/b))/b
```

Fricas [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^3}{b\arcsin(dx+c)+a}\,dx$$

[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="fricas")

[Out] integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b*arcsin(d*x + c) + a), x)

Sympy [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = e^3\left(\int \frac{c^3}{a+b\operatorname{asin}(c+dx)}\,dx + \int \frac{d^3x^3}{a+b\operatorname{asin}(c+dx)}\,dx + \int \frac{3cd^2x^2}{a+b\operatorname{asin}(c+dx)}\,dx + \int \frac{3c^2dx}{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c)),x)

[Out] e**3*(Integral(c**3/(a + b*asin(c + d*x)), x) + Integral(d**3*x**3/(a + b*asin(c + d*x)), x) + Integral(3*c*d**2*x**2/(a + b*asin(c + d*x)), x) + Integral(3*c**2*d*x/(a + b*asin(c + d*x)), x))

Maxima [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^3}{b\arcsin(dx+c)+a}\,dx$$

[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="maxima")

[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 277 vs. $2(137) = 274$.

Time = 0.33 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.91

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \frac{e^3\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(dx+c\right)\right)\sin\left(\frac{a}{b}\right)}{bd} - \frac{e^3\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(dx+c\right)\right)}{bd} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(dx+c\right)\right)\sin\left(\frac{a}{b}\right)}{2bd} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)\sin\left(\frac{a}{b}\right)}{2bd} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(dx+c\right)\right)}{bd} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)}{2bd} - \frac{e^3\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(dx+c\right)\right)}{8bd} - \frac{e^3\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)}{4bd}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] e^3*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b*d) - e^3
*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b*d) - 1/2*e^3*cos(a/b
)*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b*d) - 1/2*e^3*cos(a/b)
*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b*d) + e^3*cos(a/b)^2*si
n_integral(4*a/b + 4*arcsin(d*x + c))/(b*d) + 1/2*e^3*cos(a/b)^2*sin_integr
al(2*a/b + 2*arcsin(d*x + c))/(b*d) - 1/8*e^3*sin_integral(4*a/b + 4*arcsin
(d*x + c))/(b*d) - 1/4*e^3*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x)), x)
```

3.217 $\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 141

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd}$$

```
[Out] 1/4*e^2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d-1/4*e^2*Ci(3*(a+b*arcsin(d*x
+c))/b)*cos(3*a/b)/b/d+1/4*e^2*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b/d-1/4*e
^2*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used

$= \{4889, 12, 4731, 4491, 3384, 3380, 3383\}$

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/(4*b*d) - (e^2*Cos[(3
*a)/b]*CosIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/(4*b*d) + (e^2*Sin[a/b]*
SinIntegral[(a + b*ArcSin[c + d*x])/b])/(4*b*d) - (e^2*Sin[(3*a)/b]*SinInte
gral[(3*(a + b*ArcSin[c + d*x]))/b])/(4*b*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^2\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= -\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}\\
&= \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad-\frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad+\frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}\\
&\quad-\frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4bd}
\end{aligned}$$

$$= \frac{e^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2 \cos\left(\frac{3a}{b}\right) \text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd} + \frac{e^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2 \sin\left(\frac{3a}{b}\right) \text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.72

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \frac{e^2\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}(\right.}{4bd}$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (e^2*(Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - Cos[(3*a)/b]*CosIntegra
l[3*(a/b + ArcSin[c + d*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]]
- Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]))/(4*b*d)
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.73

method	result
derivativedivides	$-\frac{e^2\left(\text{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+\text{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(dx+\right.\right.}{4db}$
default	$-\frac{e^2\left(\text{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+\text{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(dx+\right.\right.}{4db}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d*e^2*(Ci(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)+Si(3*arcsin(d*x+c)+3*a/b)*
sin(3*a/b)-Si(arcsin(d*x+c)+a/b)*sin(a/b)-Ci(arcsin(d*x+c)+a/b)*cos(a/b))/b
```

Fricas [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^2}{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
[Out] integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b*arcsin(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx=e^2\left(\int \frac{c^2}{a+b\operatorname{asin}(c+dx)}\,dx+\int \frac{d^2x^2}{a+b\operatorname{asin}(c+dx)}\,dx+\int \frac{2cdx}{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c)),x)
[Out] e**2*(Integral(c**2/(a + b*asin(c + d*x)), x) + Integral(d**2*x**2/(a + b*a
sin(c + d*x)), x) + Integral(2*c*d*x/(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^2}{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.44

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = -\frac{e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{bd} - \frac{e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{bd} + \frac{3e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{4bd} + \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(dx+c\right)\right)}{4bd} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(dx+c\right)\right)}{4bd} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(dx+c\right)\right)}{4bd}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] -e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) - e^2*cos(a/b
)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 3/4*e^2*cos(a/
b)*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 1/4*e^2*cos(a/b)*cos_int
egral(a/b + arcsin(d*x + c))/(b*d) + 1/4*e^2*sin(a/b)*sin_integral(3*a/b +
3*arcsin(d*x + c))/(b*d) + 1/4*e^2*sin(a/b)*sin_integral(a/b + arcsin(d*x +
 c))/(b*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \int \frac{\left(c\,e+d\,e\,x\right)^2}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x)), x)
```

3.218 $\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 69

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx = -\frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2bd} + \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2bd}$$

```
[Out] 1/2*e*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b/d-1/2*e*Ci(2*(a+b*arcsin(d*x
+c))/b)*sin(2*a/b)/b/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4889, 12, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx = \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2bd} - \frac{e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2bd}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] -1/2*(e*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b])/(b*d) + (e
*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(2*b*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{ex}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e\text{Subst}\left(\int \frac{x}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}$$

$$= -\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{bd}$$

$$= -\frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx,x,a+b\arcsin(c+dx)\right)}{bd}$$

$$= -\frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2bd}$$

$$= \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2bd} - \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2bd}$$

$$= -\frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2bd} + \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2bd}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.88

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx = \frac{e\left(-\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(c+dx)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(c+dx)\right)\right)}{2bd}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x]),x]
[Out] (e*(-(CosIntegral[(2*a)/b + 2*ArcSin[c + d*x]]*Sin[(2*a)/b]) + Cos[(2*a)/b]
*SinIntegral[(2*a)/b + 2*ArcSin[c + d*x]]))/(2*b*d)
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.87

method	result	size
derivativedivides	$\frac{e\left(\text{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2db}$	60
default	$\frac{e\left(\text{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2db}$	60

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/2/d*e*(Si(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)-Ci(2*arcsin(d*x+c)+2*a/b)*sin
(2*a/b))/b
```

Fricas [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{dex+ce}{b\arcsin\left(dx+c\right)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
[Out] integral((d*e*x + c*e)/(b*arcsin(d*x + c) + a), x)
```

Sympy [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=e\left(\int \frac{c}{a+b\,\mathrm{asin}\left(c+dx\right)}\,dx+\int \frac{dx}{a+b\,\mathrm{asin}\left(c+dx\right)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c)),x)
[Out] e*(Integral(c/(a + b*asin(c + d*x)), x) + Integral(d*x/(a + b*asin(c + d*x)
), x))
```

Maxima [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{dex+ce}{b\arcsin\left(dx+c\right)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.38

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=-\frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)\sin\left(\frac{a}{b}\right)}{bd}+\frac{e\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)}{bd}-\frac{e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(dx+c\right)\right)}{2bd}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] -e*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b*d) + e*cos(
a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b*d) - 1/2*e*sin_integral(2
*a/b + 2*arcsin(d*x + c))/(b*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{c\,e+d\,e\,x}{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x)), x)
```

3.219 $\int \frac{1}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 57

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}$$

```
[Out] Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d+Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b
/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4887, 4719, 3384, 3380, 3383}

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/(b*d) + (Sin[a/b]*SinInte
gral[(a + b*ArcSin[c + d*x])/b])/(b*d)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}\\
&= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.84

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(c+dx)\right)}{bd}$$

[In] Integrate[(a + b*ArcSin[c + d*x])^(-1),x]

[Out] (Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(b*d)

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.91

method	result	size
derivativedivides	$\frac{\frac{\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{d}$	52
default	$\frac{\frac{\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{d}$	52

[In] int(1/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)

[Out] 1/d*(Si(arcsin(d*x+c)+a/b)*sin(a/b)/b+Ci(arcsin(d*x+c)+a/b)*cos(a/b)/b)

Fricas [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \int \frac{1}{b\arcsin(dx+c)+a}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="fricas")

[Out] integral(1/(b*arcsin(d*x + c) + a), x)

Sympy [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c)),x)
[Out] Integral(1/(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\int \frac{1}{b\arcsin\,(dx+c)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/(b*arcsin(d*x + c) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.93

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin\,(dx+c)\right)}{bd}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin\,(dx+c)\right)}{bd}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b*d) + sin(a/b)*sin_integral(
a/b + arcsin(d*x + c))/(b*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x)),x)
[Out] int(1/(a + b*asin(c + d*x)), x)
```

3.220 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c)),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])), x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))}\,dx,x,c+dx\right)}{d}\\&=\frac{\text{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.96 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.34 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\,(a+b\arcsin\,(dx+c))}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.35

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(dex+ce)(b\arcsin\,(dx+c)+a)}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
[Out] integral(1/(a*d*e*x + a*c*e + (b*d*e*x + b*c*e)*arcsin(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 1.03 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.48

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\frac{\int \frac{1}{ac+adx+bc\,\mathrm{asin}\,(c+dx)+bdx\,\mathrm{asin}\,(c+dx)}\,dx}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c)),x)
[Out] Integral(1/(a*c + a*d*x + b*c*asin(c + d*x) + b*d*x*asin(c + d*x)), x)/e
```

Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\,(a+b\,\mathrm{asin}\,(c+d\,x))}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))), x)
```

3.221 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 258

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^4\,\mathrm{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b^2d} - \frac{9e^4\,\mathrm{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b^2d} + \frac{5e^4\,\mathrm{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b^2d} - \frac{e^4\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^2d} + \frac{9e^4\cos\left(\frac{3a}{b}\right)\mathrm{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} - \frac{5e^4\cos\left(\frac{5a}{b}\right)\mathrm{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16b^2d}$$

```
[Out] -1/8*e^4*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+9/16*e^4*cos(3*a/b)*Si(3*
(a+b*arcsin(d*x+c))/b)/b^2/d-5/16*e^4*cos(5*a/b)*Si(5*(a+b*arcsin(d*x+c))/b
)/b^2/d+1/8*e^4*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^2/d-9/16*e^4*Ci(3*(a+b
*arcsin(d*x+c))/b)*sin(3*a/b)/b^2/d+5/16*e^4*Ci(5*(a+b*arcsin(d*x+c))/b)*si
n(5*a/b)/b^2/d-e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 12, 4727, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^4\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^2d} - \frac{9e^4\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} + \frac{5e^4\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} - \frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^2d} + \frac{9e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} - \frac{5e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} - \frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}$$

```
[In] Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -((e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x]))) +
(e^4*CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/(8*b^2*d) - (9*e^4*Co
sIntegral[(3*(a + b*ArcSin[c + d*x]))/b]*Sin[(3*a)/b])/(16*b^2*d) + (5*e^4*
CosIntegral[(5*(a + b*ArcSin[c + d*x]))/b]*Sin[(5*a)/b])/(16*b^2*d) - (e^4*
Cos[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/(8*b^2*d) + (9*e^4*Cos[(3*
a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/(16*b^2*d) - (5*e^4*Cos[(
5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/(16*b^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^4x^4}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{x^4}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}\\
&\quad+\frac{e^4\text{Subst}\left(\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{9\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx, x, a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}+\frac{e^4\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d}\\
&\quad+\frac{(5e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16b^2d}\\
&\quad-\frac{(9e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16b^2d}
\end{aligned}
$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} - \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8b^2d} + \frac{\left(9e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16b^2d} - \frac{\left(5e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16b^2d} + \frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{8b^2d} - \frac{\left(9e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16b^2d} + \frac{\left(5e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{16b^2d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^4\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b^2d} - \frac{9e^4\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b^2d} + \frac{5e^4\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b^2d} - \frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^2d} + \frac{9e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} - \frac{5e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16b^2d}$$

Mathematica [A] (verified)

Time = 1.61 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.10

$$\int\frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^4\left(-\frac{16b(c+dx)^4\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} + 16\left(-3\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) + \text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c\right.\right.\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (e^4*((-16*b*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x]) + 1
6*(-3*CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + CosIntegral[3*(a/b + Ar
cSin[c + d*x])]*Sin[(3*a)/b] + 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]
] - Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]) + 5*(10*CosIntegra
```

```
l[a/b + ArcSin[c + d*x]]*Sin[a/b] - 5*CosIntegral[3*(a/b + ArcSin[c + d*x])
]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c + d*x])]*Sin[(5*a)/b] - 10*C
os[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + 5*Cos[(3*a)/b]*SinIntegral[3*(
a/b + ArcSin[c + d*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c + d*x]
)]))/(16*b^2*d)
```

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.53

method	result
derivativedivides	$-\frac{e^4\left(5\arcsin(dx+c)\cos\left(\frac{5a}{b}\right)\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)b+9\arcsin(dx+c)\,\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b-5\arcsin(dx+c\right.}{}$
default	$-\frac{e^4\left(5\arcsin(dx+c)\cos\left(\frac{5a}{b}\right)\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)b+9\arcsin(dx+c)\,\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b-5\arcsin(dx+c\right.}{}$

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/d*e^4*(5*arcsin(d*x+c)*cos(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*b+9*arcsi
n(d*x+c)*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*b-5*arcsin(d*x+c)*sin(5*a/b)*
Ci(5*arcsin(d*x+c)+5*a/b)*b+2*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*
b-2*arcsin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b-9*arcsin(d*x+c)*cos(3*a/
b)*Si(3*arcsin(d*x+c)+3*a/b)*b+5*cos(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*a+9*C
i(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*a-5*sin(5*a/b)*Ci(5*arcsin(d*x+c)+5*a/b
)*a+2*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a-2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a-9
*cos(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a+cos(5*arcsin(d*x+c))*b-3*cos(3*arcs
in(d*x+c))*b+2*(1-(d*x+c)^2)^(1/2)*b)/(a+b*arcsin(d*x+c))/b^2
```

Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x
 + c^4*e^4)/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = e^4\left(\int \frac{c^4}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx + \int \frac{d^4x^4}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx + \int \frac{4cd^3x^3}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx + \int \frac{4c^3dx}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**2,x)
```

```
[Out] e**4*(Integral(c**4/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x
) + Integral(d**4*x**4/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2)
, x) + Integral(4*c*d**3*x**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d
*x)**2), x) + Integral(6*c**2*d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*
asin(c + d*x)**2), x) + Integral(4*c**3*d*x/(a**2 + 2*a*b*asin(c + d*x) + b
**2*asin(c + d*x)**2), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*
e^4)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x + c, sqrt(d*
x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*integrate((5*d^5*e^4*x^5 + 25*c*d^4
*e^4*x^4 + 2*(25*c^2 - 2)*d^3*e^4*x^3 + 2*(25*c^3 - 6*c)*d^2*e^4*x^2 + (25*
c^4 - 12*c^2)*d*e^4*x + (5*c^5 - 4*c^3)*e^4)*sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*
d*x + b^2*c^2 - b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))
), x))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*
d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1401 vs. $2(244) = 488$.

Time = 0.42 (sec) , antiderivative size = 1401, normalized size of antiderivative = 5.43

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 5*b*e^4*arcsin(d*x + c)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*
sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 5*b*e^4*arcsin(d*x + c)*cos(a/
b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2
*d) + 5*a*e^4*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(
b^3*d*arcsin(d*x + c) + a*b^2*d) - 5*a*e^4*cos(a/b)^5*sin_integral(5*a/b +
5*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 15/4*b*e^4*arcsin(d*
x + c)*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^3*d*a
rcsin(d*x + c) + a*b^2*d) - 9/4*b*e^4*arcsin(d*x + c)*cos(a/b)^2*cos_integr
al(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) +
25/4*b*e^4*arcsin(d*x + c)*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c
))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 9/4*b*e^4*arcsin(d*x + c)*cos(a/b)^3
*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
- 15/4*a*e^4*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b
^3*d*arcsin(d*x + c) + a*b^2*d) - 9/4*a*e^4*cos(a/b)^2*cos_integral(3*a/b +
 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 25/4*a*e^4
*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c)
+ a*b^2*d) + 9/4*a*e^4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(
b^3*d*arcsin(d*x + c) + a*b^2*d) + 5/16*b*e^4*arcsin(d*x + c)*cos_integral(
5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 9/1
6*b*e^4*arcsin(d*x + c)*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b
^3*d*arcsin(d*x + c) + a*b^2*d) + 1/8*b*e^4*arcsin(d*x + c)*cos_integral(a/
b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 25/16*b*e
^4*arcsin(d*x + c)*cos(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^3*d*
arcsin(d*x + c) + a*b^2*d) - 27/16*b*e^4*arcsin(d*x + c)*cos(a/b)*sin_integ
ral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/8*b*e^
4*arcsin(d*x + c)*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^3*d*arcsi
n(d*x + c) + a*b^2*d) - ((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b*e^4/(b
^3*d*arcsin(d*x + c) + a*b^2*d) + 5/16*a*e^4*cos_integral(5*a/b + 5*arcsin(
d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 9/16*a*e^4*cos_integ
ral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) +
 1/8*a*e^4*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x +
 c) + a*b^2*d) - 25/16*a*e^4*cos(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c
))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 27/16*a*e^4*cos(a/b)*sin_integral(3*
a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/8*a*e^4*cos(
a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

```
+ 2*(-(d*x + c)^2 + 1)^(3/2)*b*e^4/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt
(-(d*x + c)^2 + 1)*b*e^4/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(c\,e+d\,e\,x)^4}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^2, x)
```

3.222 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 190

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} + \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d}$$

```
[Out] 1/2*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^2/d-1/2*e^3*Ci(4*(a+b*arcs
in(d*x+c))/b)*cos(4*a/b)/b^2/d+1/2*e^3*Si(2*(a+b*arcsin(d*x+c))/b)*sin(2*a/
b)/b^2/d-1/2*e^3*Si(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b^2/d-e^3*(d*x+c)^3
*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {4889, 12, 4727, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} + \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -((e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x]))) +
(e^3*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(2*b^2*d) - (
e^3*Cos[(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/(2*b^2*d) + (e
^3*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(2*b^2*d) - (e^
3*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/(2*b^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^3\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{2x}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} - \frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d} + \frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d}$$

$$
\begin{aligned}
&= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} \\
&+ \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^2d} \\
&- \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^2d} \\
&+ \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^2d} \\
&- \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^2d}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} \\
&- \frac{e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} \\
&+ \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.34 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.16

$$
\int\frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx =
-\frac{e^3\left(\frac{2b(c+dx)^3\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} - 4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right) + \cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\right.\right.\right.}{}
$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -1/2*(e^3*((2*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])
- 4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] + Cos[(4*a)/b]*CosI
ntegral[4*(a/b + ArcSin[c + d*x])] + 3*Log[a + b*ArcSin[c + d*x]] - 4*Sin[(
2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])] + 3*(Cos[(2*a)/b]*CosIntegra
l[2*(a/b + ArcSin[c + d*x])] - Log[a + b*ArcSin[c + d*x]] + Sin[(2*a)/b]*Si
nIntegral[2*(a/b + ArcSin[c + d*x])]) + Sin[(4*a)/b]*SinIntegral[4*(a/b + A
rcSin[c + d*x])]))/(b^2*d)
```

Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.47

method	result
derivativedivides	$\frac{e^3\left(4\arcsin(dx+c)\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-4\arcsin(dx+c)\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b-4\arcsin(dx+c)\operatorname{co}\right.}{}$
default	$\frac{e^3\left(4\arcsin(dx+c)\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-4\arcsin(dx+c)\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b-4\arcsin(dx+c)\operatorname{co}\right.}{}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d*e^3*(4*arcsin(d*x+c)*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*b-4*arcsin(
d*x+c)*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*b-4*arcsin(d*x+c)*cos(4*a/b)*Ci
(4*arcsin(d*x+c)+4*a/b)*b+4*arcsin(d*x+c)*sin(2*a/b)*Si(2*arcsin(d*x+c)+2*a
/b)*b+4*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*a-4*sin(4*a/b)*Si(4*arcsin(d*x
+c)+4*a/b)*a-4*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a+4*sin(2*a/b)*Si(2*arc
sin(d*x+c)+2*a/b)*a+sin(4*arcsin(d*x+c))*b-2*sin(2*arcsin(d*x+c))*b)/(a+b*a
rcsin(d*x+c))/b^2
```

Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^2*arc
sin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = e^3\left(\int \frac{c^3}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{d^3x^3}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{3c^2dx}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**2,x)
```

```
[Out] e**3*(Integral(c**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x
) + Integral(d**3*x**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2)
, x) + Integral(3*c*d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d
*x)**2), x) + Integral(3*c**2*d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c
 + d*x)**2), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)*sqrt(d*x + c +
1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
 - c + 1)) + a*b*d)*integrate((4*d^4*e^3*x^4 + 16*c*d^3*e^3*x^3 + 3*(8*c^2
- 1)*d^2*e^3*x^2 + 2*(8*c^3 - 3*c)*d*e^3*x + (4*c^4 - 3*c^2)*e^3)*sqrt(d*x
+ c + 1)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b
^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arctan2(d*x + c, sqrt(d*x + c + 1
)*sqrt(-d*x - c + 1))), x))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(
-d*x - c + 1)) + a*b*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 928 vs. $2(180) = 360$.

Time = 0.41 (sec) , antiderivative size = 928, normalized size of antiderivative = 4.88

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -4*b*e^3*arcsin(d*x + c)*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c))
/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 4*b*e^3*arcsin(d*x + c)*cos(a/b)^3*sin
(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^
2*d) - 4*a*e^3*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*ar
csin(d*x + c) + a*b^2*d) - 4*a*e^3*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b +
 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 4*b*e^3*arcsin(d*x
+ c)*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x +
 c) + a*b^2*d) + b*e^3*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*ar
csin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 2*b*e^3*arcsin(d*x + c)*
cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x
 + c) + a*b^2*d) + b*e^3*arcsin(d*x + c)*cos(a/b)*sin(a/b)*sin_integral(2*a
```

```
/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 4*a*e^3*cos(a/b
)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*
d) + a*e^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin
(d*x + c) + a*b^2*d) + 2*a*e^3*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arc
sin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + a*e^3*cos(a/b)*sin(a/b)*s
in_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) +
(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b*e^3/(b^3*d*arcsin(d*x + c) + a*b^2*d)
- 1/2*b*e^3*arcsin(d*x + c)*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*
arcsin(d*x + c) + a*b^2*d) - 1/2*b*e^3*arcsin(d*x + c)*cos_integral(2*a/b +
 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt(-(d*x + c)^2 +
 1)*(d*x + c)*b*e^3/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/2*a*e^3*cos_integ
ral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/2*a*e^
3*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^2}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^2, x)
```

3.223 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 186

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx &= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} \\ &\quad+\frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2d} \\ &\quad-\frac{3e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2d} \\ &\quad-\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4b^2d} \\ &\quad+\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4b^2d}\end{aligned}$$

```
[Out] -1/4*e^2*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+3/4*e^2*cos(3*a/b)*Si(3*(
a+b*arcsin(d*x+c))/b)/b^2/d+1/4*e^2*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^2/
d-3/4*e^2*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^2/d-e^2*(d*x+c)^2*(1-(d*
x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 12, 4727, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4b^2d} - \frac{3e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4b^2d} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4b^2d} + \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4b^2d} - \frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -((e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x]))) +
(e^2*CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/(4*b^2*d) - (3*e^2*Co
sIntegral[(3*(a + b*ArcSin[c + d*x]))/b]*Sin[(3*a)/b])/(4*b^2*d) - (e^2*Cos
[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/(4*b^2*d) + (3*e^2*Cos[(3*a)/
b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/(4*b^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}\\
&\quad+\frac{e^2\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}+\frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4b^2d}\\
&\quad-\frac{(3e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{4b^2d}
\end{aligned}
$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4b^2d} + \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4b^2d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4b^2d} - \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{4b^2d}$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2d} - \frac{3e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2d} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4b^2d} + \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4b^2d}$$

Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.75

$$\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^2\left(-\frac{4b(c+dx)^2\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) - 3\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\right.}{4b^2d}$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (e^2*((-4*b*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x]) + Co
sIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin[c
 + d*x])]*Sin[(3*a)/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + 3*Co
s[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]))/(4*b^2*d)
```

Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.43

method	result
derivativedivides	$\frac{e^2\left(\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b-\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+3\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\operatorname{S}\right.}{}$
default	$\frac{e^2\left(\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b-\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+3\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\operatorname{S}\right.}{}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
[Out] 1/4/d*e^2*(arcsin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b-arcsin(d*x+c)*cos
(a/b)*Si(arcsin(d*x+c)+a/b)*b+3*arcsin(d*x+c)*cos(3*a/b)*Si(3*arcsin(d*x+c)
+3*a/b)*b-3*arcsin(d*x+c)*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*b+sin(a/b)*C
i(arcsin(d*x+c)+a/b)*a-cos(a/b)*Si(arcsin(d*x+c)+a/b)*a+3*cos(3*a/b)*Si(3*a
rcsin(d*x+c)+3*a/b)*a-3*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*a+cos(3*arcsin
(d*x+c))*b-(1-(d*x+c)^2)^(1/2)*b)/(a+b*arcsin(d*x+c))/b^2
```

Fricas [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
[Out] integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^2*arcsin(d*x + c)^2 + 2*a
*b*arcsin(d*x + c) + a^2), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx=e^2\left(\int \frac{c^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx+\int \frac{d^2x^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx+\int \frac{2cdx}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**2,x)
[Out] e**2*(Integral(c**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x
) + Integral(d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2)
, x) + Integral(2*c*d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2
), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1
) - (b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*
integrate((3*d^3*e^2*x^3 + 9*c*d^2*e^2*x^2 + (9*c^2 - 2)*d*e^2*x + (3*c^3 -
 2*c)*e^2)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x
+ a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x))/(b^2*d*arctan2(d*x + c, sqr
t(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 698 vs. $2(176) = 352$.

Time = 0.41 (sec) , antiderivative size = 698, normalized size of antiderivative = 3.75

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$$
$$= -\frac{3\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$-\frac{3\,ae^2\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,ae^2\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,be^2\arcsin(dx+c)\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{be^2\arcsin(dx+c)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{9\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{3\,ae^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}+\frac{ae^2\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{9\,ae^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}-\frac{ae^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^2}{b^3d\arcsin(dx+c)+ab^2d}-\frac{\sqrt{-(dx+c)^2+1}be^2}{b^3d\arcsin(dx+c)+ab^2d}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -3*b*e^2*arcsin(d*x + c)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))
*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3*b*e^2*arcsin(d*x + c)*cos(a
/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^
2*d) - 3*a*e^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/
(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3*a*e^2*cos(a/b)^3*sin_integral(3*a/b +
 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3/4*b*e^2*arcsin(d*
x + c)*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x +
 c) + a*b^2*d) + 1/4*b*e^2*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x +
c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 9/4*b*e^2*arcsin(d*x + c)*
cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a
*b^2*d) - 1/4*b*e^2*arcsin(d*x + c)*cos(a/b)*sin_integral(a/b + arcsin(d*x
```

```
+ c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3/4*a*e^2*cos_integral(3*a/b + 3*
arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 1/4*a*e^2*cos
_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d)
 - 9/4*a*e^2*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin
(d*x + c) + a*b^2*d) - 1/4*a*e^2*cos(a/b)*sin_integral(a/b + arcsin(d*x + c
))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + (-(d*x + c)^2 + 1)^(3/2)*b*e^2/(b^3*
d*arcsin(d*x + c) + a*b^2*d) - sqrt(-(d*x + c)^2 + 1)*b*e^2/(b^3*d*arcsin(d
*x + c) + a*b^2*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^2}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^2, x)
```

3.224 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 104

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d} + \frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d}$$

```
[Out] e*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^2/d+e*Si(2*(a+b*arcsin(d*x+c))/b
)*sin(2*a/b)/b^2/d-e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4889, 12, 4727, 3384, 3380, 3383}

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d} + \frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d} - \frac{e\sqrt{1-(c+dx)^2}(c+dx)}{bd(a+b\arcsin(c+dx))}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] -((e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x]))) + (e*C
os[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(b^2*d) + (e*Sin[(2
*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(b^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}\\
&= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}
\end{aligned}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} + \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d} + \frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d}$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.95

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e\left(-\frac{b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}}{a+b\arcsin(c+dx)} + \cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right) + \sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\arcsin(c+\right.\right.\right.}{b^2d}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (e*(-((b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/(a + b*ArcSin[c + d*x
])) + Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] + Sin[(2*a)/b]*Si
nIntegral[2*(a/b + ArcSin[c + d*x])]))/(b^2*d)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.45

method	result
derivativedivides	$\frac{e\left(2\arcsin(dx+c)\,\text{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b+2\arcsin(dx+c)\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b+2\,\text{Ci}\left(2\arcsin(dx\right.\right.}{2d(a+b\arcsin(dx+c))b^2}$
default	$\frac{e\left(2\arcsin(dx+c)\,\text{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b+2\arcsin(dx+c)\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b+2\,\text{Ci}\left(2\arcsin(dx\right.\right.}{2d(a+b\arcsin(dx+c))b^2}$

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d*e*(2*arcsin(d*x+c)*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*b+2*arcsin(d*
x+c)*sin(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b+2*Ci(2*arcsin(d*x+c)+2*a/b)*cos
(2*a/b)*a+2*sin(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a-sin(2*arcsin(d*x+c))*b)/
(a+b*arcsin(d*x+c))/b^2
```

Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{dex+ce}{(b\arcsin{(dx+c)}+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
[Out] integral((d*e*x + c*e)/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2
), x)
```

Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=e\left(\int \frac{c}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx+\int \frac{dx}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**2,x)
[Out] e*(Integral(c/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x) + In
tegral(d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x))
```

Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{dex+ce}{(b\arcsin{(dx+c)}+a)^2}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
[Out] -((d*e*x + c*e)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*integrate((2*d^2*e*x^2 +
 4*c*d*e*x + (2*c^2 - 1)*e)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)/(a*b*d^2*x
^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b
^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x))/(b^2*d*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 341 vs. $2(102) = 204$.

Time = 0.37 (sec) , antiderivative size = 341, normalized size of antiderivative = 3.28

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = \frac{2\,be\arcsin\left(dx+c\right)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d} + \frac{2\,be\arcsin\left(dx+c\right)\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d} + \frac{2\,ae\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d} + \frac{2\,ae\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d} - \frac{be\arcsin\left(dx+c\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d} - \frac{\sqrt{-\left(dx+c\right)^2+1}(dx+c)be}{b^3d\arcsin\left(dx+c\right)+ab^2d} - \frac{ae\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(dx+c\right)\right)}{b^3d\arcsin\left(dx+c\right)+ab^2d}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 2*b*e*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b
^3*d*arcsin(d*x + c) + a*b^2*d) + 2*b*e*arcsin(d*x + c)*cos(a/b)*sin(a/b)*s
in_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) +
2*a*e*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x
+ c) + a*b^2*d) + 2*a*e*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x
 + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - b*e*arcsin(d*x + c)*cos_integral
(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt(-(d*x
+ c)^2 + 1)*(d*x + c)*b*e/(b^3*d*arcsin(d*x + c) + a*b^2*d) - a*e*cos_integ
ral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{c\,e+d\,e\,x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^2,x)
```

```
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^2, x)
```

3.225 $\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 93

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2d} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2d}$$

```
[Out] -cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+Ci((a+b*arcsin(d*x+c))/b)*sin(a/b
)/b^2/d-(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4717, 4809, 3384, 3380, 3383}

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2d} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2d} - \frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-2),x]
```

```
[Out] -(Sqrt[1 - (c + d*x)^2]/(b*d*(a + b*ArcSin[c + d*x]))) + (CosIntegral[(a +
b*ArcSin[c + d*x])/b]*Sin[a/b])/(b^2*d) - (Cos[a/b]*SinIntegral[(a + b*ArcS
in[c + d*x])/b])/(b^2*d)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))}\,dx, x, c+dx\right)}{bd}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2d} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2d}$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.85

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \frac{-\frac{b\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(c+dx)\right)}{b^2d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-2),x]
[Out] (-((b*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])) + CosIntegral[a/b + A
rcSin[c + d*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(b^
2*d)
```

Maple [A] (verified)

Time = 0.41 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.88

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{1-(dx+c)^2}}{(a+b\arcsin(dx+c))b}+\frac{\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{d}$	82
default	$\frac{-\frac{\sqrt{1-(dx+c)^2}}{(a+b\arcsin(dx+c))b}+\frac{\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{d}$	82

```
[In] int(1/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
[Out] 1/d*(-(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))/b+(Ci(arcsin(d*x+c)+a/b)*sin(
a/b)-Si(arcsin(d*x+c)+a/b)*cos(a/b))/b^2)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^2}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")

[Out] integral(1/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^2}\,dx$$

[In] integrate(1/(a+b*asin(d*x+c))**2,x)

[Out] Integral((a + b*asin(c + d*x))**(-2), x)

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^2}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")

[Out] ((b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*integrate(sqrt(d*x + c + 1)*(d*x + c)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x) - sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 215 vs. $2(91) = 182$.

Time = 0.31 (sec) , antiderivative size = 215, normalized size of antiderivative = 2.31

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \frac{b\arcsin(dx+c)\,\mathrm{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{b\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d} + \frac{a\,\mathrm{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{a\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{\sqrt{-(dx+c)^2+1b}}{b^3d\arcsin(dx+c)+ab^2d}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] b*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsi
n(d*x + c) + a*b^2*d) - b*arcsin(d*x + c)*cos(a/b)*sin_integral(a/b + arcsi
n(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + a*cos_integral(a/b + arcsin
(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - a*cos(a/b)*sin_inte
gral(a/b + arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt(-(d*x
+ c)^2 + 1)*b/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^2,x)
```

```
[Out] int(1/(a + b*asin(c + d*x))^2, x)
```

3.226 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^2},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^2,x)/e
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^2), x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\operatorname{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{d} \\ &= \frac{\operatorname{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 4.96 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.38 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\,(a+b\arcsin\,(dx+c))^2}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 61, normalized size of antiderivative = 2.65

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(dex+ce)(b\arcsin\,(dx+c)+a)^2}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*d*e*x + a^2*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c)^2 +
 2*(a*b*d*e*x + a*b*c*e)*arcsin(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 1.86 (sec) , antiderivative size = 73, normalized size of antiderivative = 3.17

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \frac{\int \frac{1}{a^2c+a^2dx+2abc\operatorname{asin}(c+dx)+2abdx\operatorname{asin}(c+dx)+b^2c\operatorname{asin}^2(c+dx)+b^2dx\operatorname{asin}^2(c+dx)}\,dx}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**2,x)
```

```
[Out] Integral(1/(a**2*c + a**2*d*x + 2*a*b*c*asin(c + d*x) + 2*a*b*d*x*asin(c +
d*x) + b**2*c*asin(c + d*x)**2 + b**2*d*x*asin(c + d*x)**2), x)/e
```

Maxima [N/A]

Not integrable

Time = 4.16 (sec) , antiderivative size = 357, normalized size of antiderivative = 15.52

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*d^2*e*x + a*b*c*d*e + (b^2*d^2*e*x + b^2*c*d*e)*arctan2(d*x + c, sqrt
(d*x + c + 1)*sqrt(-d*x - c + 1)))*integrate(sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1)/(a*b*d^4*e*x^4 + 4*a*b*c*d^3*e*x^3 + (6*a*b*c^2 - a*b)*d^2*e*x^2 + 2
*(2*a*b*c^3 - a*b*c)*d*e*x + (a*b*c^4 - a*b*c^2)*e + (b^2*d^4*e*x^4 + 4*b^2
*c*d^3*e*x^3 + (6*b^2*c^2 - b^2)*d^2*e*x^2 + 2*(2*b^2*c^3 - b^2*c)*d*e*x +
(b^2*c^4 - b^2*c^2)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1
))), x) - sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(a*b*d^2*e*x + a*b*c*d*e +
(b^2*d^2*e*x + b^2*c*d*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c
+ 1)))
```

Giac [N/A]

Not integrable

Time = 2.15 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^2}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\ (a+b\,\mathrm{asin}\,(c+d\,x))^2}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^2),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^2), x)
```

3.227 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 322

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} - \frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d}$$

```
[Out] -2*e^4*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))+5/2*e^4*(d*x+c)^5/b^2/d/(a+b*arc
sin(d*x+c))-1/16*e^4*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^3/d+27/32*e^4*Ci(
3*(a+b*arcsin(d*x+c))/b)*cos(3*a/b)/b^3/d-25/32*e^4*Ci(5*(a+b*arcsin(d*x+c)
)/b)*cos(5*a/b)/b^3/d-1/16*e^4*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^3/d+27/
32*e^4*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^3/d-25/32*e^4*Si(5*(a+b*arc
sin(d*x+c))/b)*sin(5*a/b)/b^3/d-1/2*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)/b/d/(
a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} - \frac{e^4\sqrt{1-(c+dx)^2}(c+dx)^4}{2bd(a+b\arcsin(c+dx))^2}$$

```
[In] Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] -1/2*(e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^2
) - (2*e^4*(c + d*x)^3)/(b^2*d*(a + b*ArcSin[c + d*x])) + (5*e^4*(c + d*x)^
5)/(2*b^2*d*(a + b*ArcSin[c + d*x])) - (e^4*Cos[a/b]*CosIntegral[(a + b*Arc
Sin[c + d*x])/b])/(16*b^3*d) + (27*e^4*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c + d*x]))/b])/(32*b^3*d) - (25*e^4*Cos[(5*a)/b]*CosIntegral[(5*(a +
b*ArcSin[c + d*x]))/b])/(32*b^3*d) - (e^4*Sin[a/b]*SinIntegral[(a + b*ArcSi
n[c + d*x])/b])/(16*b^3*d) + (27*e^4*Sin[(3*a)/b]*SinIntegral[(3*(a + b*Arc
Sin[c + d*x]))/b])/(32*b^3*d) - (25*e^4*Sin[(5*a)/b]*SinIntegral[(5*(a + b*
ArcSin[c + d*x]))/b])/(32*b^3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^4x^4}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^4\text{Subst}\left(\int \frac{x^4}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{(2e^4)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{bd} - \frac{(5e^4)\,\text{Subst}\left(\int \frac{x^5}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{2bd}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} + \frac{(6e^4)\,\text{Subst}\left(\int \frac{x^2}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{b^2d} - \frac{(25e^4)\,\text{Subst}\left(\int \frac{x^4}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{2b^2d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} + \frac{(6e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{(25e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} + \frac{(6e^4)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{(25e^4)\,\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))}$$
$$+ \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))}$$
$$- \frac{(25e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d}$$
$$- \frac{(3e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}$$
$$+ \frac{(3e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}$$
$$- \frac{(25e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16b^3d}$$
$$+ \frac{(75e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} + \frac{\left(3e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} - \frac{\left(25e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16b^3d} - \frac{\left(3e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} + \frac{\left(75e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d} - \frac{\left(25e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d} + \frac{\left(3e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} - \frac{\left(25e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{16b^3d} - \frac{\left(3e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} + \frac{\left(75e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d} - \frac{\left(25e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^3d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))} + \frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} - \frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} + \frac{27e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} - \frac{25e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d}$$

Mathematica [A] (verified)

Time = 1.53 (sec) , antiderivative size = 317, normalized size of antiderivative = 0.98

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= \frac{e^4\left(-\frac{16b^2(c+dx)^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{16b(-4(c+dx)^3+5(c+dx)^5)}{a+b\arcsin(c+dx)}+48\left(\cos\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-\cos\left(\frac{3a}{b}\right.\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e^4*((-16*b^2*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2
 + (16*b*(-4*(c + d*x)^3 + 5*(c + d*x)^5))/(a + b*ArcSin[c + d*x]) + 48*(Co
s[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - Cos[(3*a)/b]*CosIntegral[3*(a/b
 + ArcSin[c + d*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] - Sin[(3
*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]) - 25*(2*Cos[a/b]*CosIntegral
[a/b + ArcSin[c + d*x]] - 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c + d*
x])] + Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c + d*x])] + 2*Sin[a/b]*Sin
Integral[a/b + ArcSin[c + d*x]] - 3*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSi
n[c + d*x])] + Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c + d*x])])))/(32*b
^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 719 vs. 2(304) = 608.

Time = 0.87 (sec) , antiderivative size = 720, normalized size of antiderivative = 2.24

method	result
derivativedivides	$\frac{e^4\left(54\arcsin(dx+c)\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab+54\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab-50\arcsin(\right.}{}$
default	$\frac{e^4\left(54\arcsin(dx+c)\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab+54\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab-50\arcsin(\right.}{}$

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/d*e^4*(54*arcsin(d*x+c)*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a*b+54*ar
csin(d*x+c)*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b-50*arcsin(d*x+c)*sin(5
*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*a*b-50*arcsin(d*x+c)*cos(5*a/b)*Ci(5*arcsin
(d*x+c)+5*a/b)*a*b-4*arcsin(d*x+c)*sin(a/b)*Si(arcsin(d*x+c)+a/b)*a*b-4*arc
sin(d*x+c)*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b+2*a*b*(d*x+c)-25*arcsin(d*x+c
)^2*sin(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*b^2-25*arcsin(d*x+c)^2*cos(5*a/b)*
Ci(5*arcsin(d*x+c)+5*a/b)*b^2-2*arcsin(d*x+c)^2*sin(a/b)*Si(arcsin(d*x+c)+a
/b)*b^2-2*arcsin(d*x+c)^2*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*b^2+27*arcsin(d*x+
```

```
c)^2*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*b^2+27*arcsin(d*x+c)^2*cos(3*a/b)
*Ci(3*arcsin(d*x+c)+3*a/b)*b^2+3*cos(3*arcsin(d*x+c))*b^2-cos(5*arcsin(d*x+
c))*b^2-2*(1-(d*x+c)^2)^(1/2)*b^2+27*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a
^2+27*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2-9*sin(3*arcsin(d*x+c))*a*b+5
*arcsin(d*x+c)*sin(5*arcsin(d*x+c))*b^2-25*sin(5*a/b)*Si(5*arcsin(d*x+c)+5*
a/b)*a^2-25*cos(5*a/b)*Ci(5*arcsin(d*x+c)+5*a/b)*a^2+5*sin(5*arcsin(d*x+c))
*a*b+2*arcsin(d*x+c)*b^2*(d*x+c)-2*sin(a/b)*Si(arcsin(d*x+c)+a/b)*a^2-2*cos
(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2-9*arcsin(d*x+c)*sin(3*arcsin(d*x+c))*b^2)/(
a+b*arcsin(d*x+c))^2/b^3
```

Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x
 + c^4*e^4)/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*ar
csin(d*x + c) + a^3), x)
```

Sympy [F]

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx &= e^4\left(\int \frac{c^4}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\right.\\ &\quad+\int \frac{d^4x^4}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\\ &\quad+\int \frac{4cd^3x^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\\ &\quad+\int \frac{6c^2d^2x^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\\ &\quad\left.+\int \frac{4c^3dx}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\right)\end{aligned}$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**3,x)
```

```
[Out] e**4*(Integral(c**4/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)
**2 + b**3*asin(c + d*x)**3), x) + Integral(d**4*x**4/(a**3 + 3*a**2*b*asin
(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Integr
```

```
al(4*c*d**3*x**3/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2
 + b**3*asin(c + d*x)**3), x) + Integral(6*c**2*d**2*x**2/(a**3 + 3*a**2*b*
asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + In
tegral(4*c**3*d*x/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**
2 + b**3*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin{(dx+c)}+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(5*a*d^5*e^4*x^5 + 25*a*c*d^4*e^4*x^4 + 2*(25*a*c^2 - 2*a)*d^3*e^4*x^3
+ 2*(25*a*c^3 - 6*a*c)*d^2*e^4*x^2 + (25*a*c^4 - 12*a*c^2)*d*e^4*x + (5*a*c
^5 - 4*a*c^3)*e^4 - (b*d^4*e^4*x^4 + 4*b*c*d^3*e^4*x^3 + 6*b*c^2*d^2*e^4*x^
2 + 4*b*c^3*d*e^4*x + b*c^4*e^4)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) + (5*
b*d^5*e^4*x^5 + 25*b*c*d^4*e^4*x^4 + 2*(25*b*c^2 - 2*b)*d^3*e^4*x^3 + 2*(25
*b*c^3 - 6*b*c)*d^2*e^4*x^2 + (25*b*c^4 - 12*b*c^2)*d*e^4*x + (5*b*c^5 - 4*
b*c^3)*e^4)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4
*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate(
1/2*(25*d^4*e^4*x^4 + 100*c*d^3*e^4*x^3 + 6*(25*c^2 - 2)*d^2*e^4*x^2 + 4*(2
5*c^3 - 6*c)*d*e^4*x + (25*c^4 - 12*c^2)*e^4)/(b^3*arctan2(d*x + c, sqrt(d*
x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*d*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c
 + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3180 vs. $2(304) = 608$.

Time = 0.61 (sec) , antiderivative size = 3180, normalized size of antiderivative = 9.88

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -25/2*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(d*
x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) -
 25/2*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*
arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2
*b^3*d) - 25*a*b*e^4*arcsin(d*x + c)*cos(a/b)^5*cos_integral(5*a/b + 5*arcs
```

```
in(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3
*d) - 25*a*b*e^4*arcsin(d*x + c)*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5
*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^
2*b^3*d) + 125/8*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(5*a/b +
5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) - 25/2*a^2*e^4*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(d*x + c))
/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 27/8*b
^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))
/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 75/8*b
^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(
d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 25/2*a^2*e^4*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))
/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 27/8*b
^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(
d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 + 125/4*a*b*e^4*arcsin(d*x + c)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(d
*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
+ 27/4*a*b*e^4*arcsin(d*x + c)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x
 + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) +
75/4*a*b*e^4*arcsin(d*x + c)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arc
sin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^
3*d) + 27/4*a*b*e^4*arcsin(d*x + c)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b
+ 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
 a^2*b^3*d) + 5/2*((d*x + c)^2 - 1)^2*(d*x + c)*b^2*e^4*arcsin(d*x + c)/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 125/32*b^2
*e^4*arcsin(d*x + c)^2*cos(a/b)*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 125/8*a^2*
e^4*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x +
c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 81/32*b^2*e^4*arcsin(d*x +
c)^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c
)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 27/8*a^2*e^4*cos(a/b)^3*cos_
integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*ar
csin(d*x + c) + a^2*b^3*d) - 1/16*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)*cos_in
tegral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d
*x + c) + a^2*b^3*d) - 25/32*b^2*e^4*arcsin(d*x + c)^2*sin(a/b)*sin_integra
l(5*a/b + 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*
x + c) + a^2*b^3*d) + 75/8*a^2*e^4*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b +
 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
a^2*b^3*d) - 27/32*b^2*e^4*arcsin(d*x + c)^2*sin(a/b)*sin_integral(3*a/b +
3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) + 27/8*a^2*e^4*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(
d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 1/16*b^2*e^4*arcsin(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin(d*x +
c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 5/2
*((d*x + c)^2 - 1)^2*(d*x + c)*a*b*e^4/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d
```

```
*arcsin(d*x + c) + a^2*b^3*d) + 3*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^4*arcsi
n(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) - 125/16*a*b*e^4*arcsin(d*x + c)*cos(a/b)*cos_integral(5*a/b + 5*arcsin(d
*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
- 81/16*a*b*e^4*arcsin(d*x + c)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(d*x
+ c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1
/8*a*b*e^4*arcsin(d*x + c)*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 25/16*a*b*
e^4*arcsin(d*x + c)*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^5*d
*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 27/16*a*b*e^4
*arcsin(d*x + c)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*ar
csin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8*a*b*e^4*arcs
in(d*x + c)*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x
+ c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*((d*x + c)^2 - 1)^2*s
qrt(-(d*x + c)^2 + 1)*b^2*e^4/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d
*x + c) + a^2*b^3*d) + 3*((d*x + c)^2 - 1)*(d*x + c)*a*b*e^4/(b^5*d*arcsin(
d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*(d*x + c)*b^2*e^4
*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2
*b^3*d) - 125/32*a^2*e^4*cos(a/b)*cos_integral(5*a/b + 5*arcsin(d*x + c))/(
b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 81/32*a^
2*e^4*cos(a/b)*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x +
c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/16*a^2*e^4*cos(a/b)*cos_i
ntegral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(
d*x + c) + a^2*b^3*d) - 25/32*a^2*e^4*sin(a/b)*sin_integral(5*a/b + 5*arcsi
n(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*
d) - 27/32*a^2*e^4*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*
arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/16*a^2*e^4*s
in(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*
b^4*d*arcsin(d*x + c) + a^2*b^3*d) + (-(d*x + c)^2 + 1)^(3/2)*b^2*e^4/(b^5*
d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*(d*x + c
)*a*b*e^4/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 1/2*sqrt(-(d*x + c)^2 + 1)*b^2*e^4/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*
arcsin(d*x + c) + a^2*b^3*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^4}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3}\,dx$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^3, x)
```

3.228 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 249

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} + \frac{e^3\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2b^3d} - \frac{e^3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{b^3d} - \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^3d} + \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{b^3d}$$

```
[Out] -3/2*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))+2*e^3*(d*x+c)^4/b^2/d/(a+b*arc
sin(d*x+c))-1/2*e^3*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b^3/d+e^3*cos(4*
a/b)*Si(4*(a+b*arcsin(d*x+c))/b)/b^3/d+1/2*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*
sin(2*a/b)/b^3/d-e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b^3/d-1/2*e^3*(
d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = \frac{e^3\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^3d} - \frac{e^3\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{b^3d} - \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^3d} + \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{b^3d} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} - \frac{e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{2bd(a+b\arcsin(c+dx))^2}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] -1/2*(e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^2
) - (3*e^3*(c + d*x)^2)/(2*b^2*d*(a + b*ArcSin[c + d*x])) + (2*e^3*(c + d*x
)^4)/(b^2*d*(a + b*ArcSin[c + d*x])) + (e^3*CosIntegral[(2*(a + b*ArcSin[c
+ d*x]))/b]*Sin[(2*a)/b])/(2*b^3*d) - (e^3*CosIntegral[(4*(a + b*ArcSin[c +
 d*x]))/b]*Sin[(4*a)/b])/(b^3*d) - (e^3*Cos[(2*a)/b]*SinIntegral[(2*(a + b*
ArcSin[c + d*x]))/b])/(2*b^3*d) + (e^3*Cos[(4*a)/b]*SinIntegral[(4*(a + b*A
rcSin[c + d*x]))/b])/(b^3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{(3e^3)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{2bd} - \frac{(2e^3)\,\text{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{bd}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} + \frac{(3e^3)\,\text{Subst}\left(\int \frac{x}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{b^2d} - \frac{(8e^3)\,\text{Subst}\left(\int \frac{x^3}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{b^2d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} - \frac{(3e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{(8e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} - \frac{(3e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{(8e^3)\,\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x} + \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} - \frac{e^3\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{(3e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} + \frac{(2e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} + \frac{\left(3e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} - \frac{\left(2e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{\left(3e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d} + \frac{\left(2e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))} + \frac{e^3\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2b^3d} - \frac{e^3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{b^3d} - \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^3d} + \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{b^3d}$$

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.73

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= \frac{e^3\left(-\frac{b^2(c+dx)^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{b(-3(c+dx)^2+4(c+dx)^4)}{a+b\arcsin(c+dx)}+\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right)-2\operatorname{CosInte}\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e^3*(-((b^2*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2)
+ (b*(-3*(c + d*x)^2 + 4*(c + d*x)^4))/(a + b*ArcSin[c + d*x]) + CosIntegra
l[2*(a/b + ArcSin[c + d*x])]*Sin[(2*a)/b] - 2*CosIntegral[4*(a/b + ArcSin[c
 + d*x])]*Sin[(4*a)/b] - Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])
] + 2*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x])]))/(2*b^3*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 506 vs. 2(239) = 478.

Time = 0.34 (sec) , antiderivative size = 507, normalized size of antiderivative = 2.04

method	result
derivativedivides	$-\frac{e^3\left(16\arcsin(dx+c)^2\sin\left(\frac{4a}{b}\right)\operatorname{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b^2-16\arcsin(dx+c)^2\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b^2+8\operatorname{arcs}\right.}{}$
default	$-\frac{e^3\left(16\arcsin(dx+c)^2\sin\left(\frac{4a}{b}\right)\operatorname{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b^2-16\arcsin(dx+c)^2\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b^2+8\operatorname{arcs}\right.}{}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/d*e^3*(16*arcsin(d*x+c)^2*sin(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*b^2-16
*arcsin(d*x+c)^2*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*b^2+8*arcsin(d*x+c)^2
*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b^2-8*arcsin(d*x+c)^2*sin(2*a/b)*Ci(2
*arcsin(d*x+c)+2*a/b)*b^2+32*arcsin(d*x+c)*sin(4*a/b)*Ci(4*arcsin(d*x+c)+4*
a/b)*a*b-32*arcsin(d*x+c)*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*a*b+16*arcsi
n(d*x+c)*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a*b-16*arcsin(d*x+c)*sin(2*a/
b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b-4*arcsin(d*x+c)*cos(4*arcsin(d*x+c))*b^2+4
*arcsin(d*x+c)*cos(2*arcsin(d*x+c))*b^2+16*sin(4*a/b)*Ci(4*arcsin(d*x+c)+4*
a/b)*a^2-16*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*a^2+8*cos(2*a/b)*Si(2*arcs
in(d*x+c)+2*a/b)*a^2-8*sin(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^2-4*cos(4*arc
sin(d*x+c))*a*b+2*sin(2*arcsin(d*x+c))*b^2+4*cos(2*arcsin(d*x+c))*a*b-sin(4
*arcsin(d*x+c))*b^2)/(a+b*arcsin(d*x+c))^2/b^3
```

Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^3*arc
sin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsin(d*x + c) + a^3)
, x)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = e^3\left(\int \frac{c^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{d^3x^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{3c^2dx}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**3,x)
```

```
[Out] e**3*(Integral(c**3/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)
**2 + b**3*asin(c + d*x)**3), x) + Integral(d**3*x**3/(a**3 + 3*a**2*b*asin
(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Integr
al(3*c*d**2*x**2/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2
 + b**3*asin(c + d*x)**3), x) + Integral(3*c**2*d*x/(a**3 + 3*a**2*b*asin(c
 + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(4*a*d^4*e^3*x^4 + 16*a*c*d^3*e^3*x^3 + 3*(8*a*c^2 - a)*d^2*e^3*x^2 + 2
*(8*a*c^3 - 3*a*c)*d*e^3*x + (4*a*c^4 - 3*a*c^2)*e^3 - (b*d^3*e^3*x^3 + 3*b
*c*d^2*e^3*x^2 + 3*b*c^2*d*e^3*x + b*c^3*e^3)*sqrt(d*x + c + 1)*sqrt(-d*x -
 c + 1) + (4*b*d^4*e^3*x^4 + 16*b*c*d^3*e^3*x^3 + 3*(8*b*c^2 - b)*d^2*e^3*x
^2 + 2*(8*b*c^3 - 3*b*c)*d*e^3*x + (4*b*c^4 - 3*b*c^2)*e^3)*arctan2(d*x + c
, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(d*x + c, sqrt(d*
x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c
+ 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate((8*d^3*e^3*x^3 + 24*c*d^2*e
^3*x^2 + 3*(8*c^2 - 1)*d*e^3*x + (8*c^3 - 3*c)*e^3)/(b^3*arctan2(d*x + c, s
qrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*d*arctan2(d*x + c,
sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2201 vs. $2(239) = 478$.

Time = 0.54 (sec) , antiderivative size = 2201, normalized size of antiderivative = 8.84

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx=\text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -8*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x +
 c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^
3*d) + 8*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin
(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) - 16*a*b*e^3*arcsin(d*x + c)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x
 + c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*
b^3*d) + 16*a*b*e^3*arcsin(d*x + c)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsi
n(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*
d) + 4*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)*cos_integral(4*a/b + 4*arcsin(d*x
 + c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*
b^3*d) - 8*a^2*e^3*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a
/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + b^2
*e^3*arcsin(d*x + c)^2*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin
```

(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 8
*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(d*x + c
))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 8*a^
2*e^3*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^5*d*arcsin(d*x
+ c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - b^2*e^3*arcsin(d*x + c)^2
*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^
2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 8*a*b*e^3*arcsin(d*x + c)*cos(
a/b)*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x + c
)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*a*b*e^3*arcsin(d*x + c)*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x +
 c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 16*a*b*e^3*arcsin(d*x + c)
*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^
2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 2*a*b*e^3*arcsin(d*x + c)*cos(
a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2
*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*((d*x + c)^2 - 1)^2*b^2*e^3*arcsi
n(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) + 4*a^2*e^3*cos(a/b)*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + a^2*e^3*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x +
 c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + b^2*e^3*arcsin(d*x + c)^2*
sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*
d*arcsin(d*x + c) + a^2*b^3*d) - 8*a^2*e^3*cos(a/b)^2*sin_integral(4*a/b +
4*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) + 1/2*b^2*e^3*arcsin(d*x + c)^2*sin_integral(2*a/b + 2*arcsin(d*x
 + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) -
a^2*e^3*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*
x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*(-(d*x + c)^2 + 1)^
(3/2)*(d*x + c)*b^2*e^3/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c
) + a^2*b^3*d) + 2*((d*x + c)^2 - 1)^2*a*b*e^3/(b^5*d*arcsin(d*x + c)^2 + 2
*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 5/2*((d*x + c)^2 - 1)*b^2*e^3*arcsi
n(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) + 2*a*b*e^3*arcsin(d*x + c)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^5*
d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + a*b*e^3*arcs
in(d*x + c)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^
2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*sqrt(-(d*x + c)^2 + 1)*(d*
x + c)*b^2*e^3/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b
^3*d) + 5/2*((d*x + c)^2 - 1)*a*b*e^3/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*
arcsin(d*x + c) + a^2*b^3*d) + 1/2*b^2*e^3*arcsin(d*x + c)/(b^5*d*arcsin(d*
x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + a^2*e^3*sin_integral(4*
a/b + 4*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x +
c) + a^2*b^3*d) + 1/2*a^2*e^3*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*
d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*a*b*e^3/
(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{{\left(c\,e+d\,e\,x\right)}^3}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^3, x)
```

3.229 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 248

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx &= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} \\ &\quad -\frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))}+\frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))} \\ &\quad -\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} \\ &\quad +\frac{9e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d} \\ &\quad -\frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} \\ &\quad +\frac{9e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d}\end{aligned}$$

```
[Out] -e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))+3/2*e^2*(d*x+c)^3/b^2/d/(a+b*arcsin(
d*x+c))-1/8*e^2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^3/d+9/8*e^2*Ci(3*(a+b*
arcsin(d*x+c))/b)*cos(3*a/b)/b^3/d-1/8*e^2*Si((a+b*arcsin(d*x+c))/b)*sin(a/
b)/b^3/d+9/8*e^2*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^3/d-1/2*e^2*(d*x+
c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3384, 3380, 3383, 4719}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx=-\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d}+\frac{9e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d}-\frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d}+\frac{9e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d}+\frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))}-\frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))}-\frac{e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{2bd(a+b\arcsin(c+dx))^2}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] -1/2*(e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^2
) - (e^2*(c + d*x))/(b^2*d*(a + b*ArcSin[c + d*x])) + (3*e^2*(c + d*x)^3)/(
2*b^2*d*(a + b*ArcSin[c + d*x])) - (e^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[
c + d*x])/b])/(8*b^3*d) + (9*e^2*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[
c + d*x]))/b])/(8*b^3*d) - (e^2*Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x]
)/b])/(8*b^3*d) + (9*e^2*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]
))/b])/(8*b^3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}+\frac{e^2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{bd}\\
&\quad-\frac{(3e^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{2bd}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}-\frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))}+\frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{1}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{b^2d}-\frac{(9e^2)\,\text{Subst}\left(\int \frac{x^2}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{2b^2d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}-\frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))}\\
&\quad+\frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))}+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{b^3d}\\
&\quad-\frac{(9e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^3d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}-\frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))}\\
&\quad+\frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad-\frac{(9e^2)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{2b^3d}\\
&\quad+\frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{b^3d}\\
&\quad+\frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{b^3d}
\end{aligned}$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))} + \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^3d} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^3d} + \frac{(9e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d} - \frac{(9e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d}$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))} + \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^3d} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^3d} - \frac{\left(9e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d} + \frac{\left(9e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d} - \frac{\left(9e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d} + \frac{\left(9e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^3d}$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} + \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d} - \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} + \frac{9e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d}$$

Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.88

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= \frac{e^2\left(-\frac{4b^2(c+dx)^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{4b(-2(c+dx)+3(c+dx)^3)}{a+b\arcsin(c+dx)}+8\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (e^2*((-4*b^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2
+ (4*b*(-2*(c + d*x) + 3*(c + d*x)^3))/(a + b*ArcSin[c + d*x]) + 8*(Cos[a/b
]*CosIntegral[a/b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b + ArcSin[c
+ d*x]]) + 9*(-(Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]]) + Cos[(3*a)/b]
*CosIntegral[3*(a/b + ArcSin[c + d*x])] - Sin[a/b]*SinIntegral[a/b + ArcSin
[c + d*x]] + Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])])))/(8*b^3*
d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 475 vs. 2(234) = 468.

Time = 0.75 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.92

method	result
derivativedivides	$\frac{e^2\left(9\arcsin(dx+c)^2\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2+9\arcsin(dx+c)^2\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2-\arcsin(dx\right.}{}$
default	$\frac{e^2\left(9\arcsin(dx+c)^2\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2+9\arcsin(dx+c)^2\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2-\arcsin(dx\right.}{}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/d*e^2*(9*arcsin(d*x+c)^2*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*b^2+9*arc
sin(d*x+c)^2*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*b^2-arcsin(d*x+c)^2*sin(a
/b)*Si(arcsin(d*x+c)+a/b)*b^2-arcsin(d*x+c)^2*cos(a/b)*Ci(arcsin(d*x+c)+a/b
)*b^2+18*arcsin(d*x+c)*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b+18*arcsin(d
*x+c)*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a*b-2*arcsin(d*x+c)*sin(a/b)*Si(
arcsin(d*x+c)+a/b)*a*b-2*arcsin(d*x+c)*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b-3
*arcsin(d*x+c)*sin(3*arcsin(d*x+c))*b^2+arcsin(d*x+c)*b^2*(d*x+c)+9*cos(3*a
/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2+9*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a^
2-sin(a/b)*Si(arcsin(d*x+c)+a/b)*a^2-cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2+cos
(3*arcsin(d*x+c))*b^2-3*sin(3*arcsin(d*x+c))*a*b-(1-(d*x+c)^2)^(1/2)*b^2+a*
b*(d*x+c))/(a+b*arcsin(d*x+c))^2/b^3
```

Fricas [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^3*arcsin(d*x + c)^3 + 3*a
*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsin(d*x + c) + a^3), x)
```

Sympy [F]

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx \\ = e^2\Bigg(\int \frac{c^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx \\ +\int \frac{d^2x^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx \\ +\int \frac{2cdx}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\Bigg)\end{aligned}$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**3,x)
```

```
[Out] e**2*(Integral(c**2/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)
**2 + b**3*asin(c + d*x)**3), x) + Integral(d**2*x**2/(a**3 + 3*a**2*b*asin
(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Integr
al(2*c*d*x/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**
3*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(3*a*d^3*e^2*x^3 + 9*a*c*d^2*e^2*x^2 + (9*a*c^2 - 2*a)*d*e^2*x + (3*a*c
^3 - 2*a*c)*e^2 - (b*d^2*e^2*x^2 + 2*b*c*d*e^2*x + b*c^2*e^2)*sqrt(d*x + c
+ 1)*sqrt(-d*x - c + 1) + (3*b*d^3*e^2*x^3 + 9*b*c*d^2*e^2*x^2 + (9*b*c^2 -
 2*b)*d*e^2*x + (3*b*c^3 - 2*b*c)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*s
qrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
```

```
- c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
1)) + a^2*b^2*d)*integrate(1/2*(9*d^2*e^2*x^2 + 18*c*d*e^2*x + (9*c^2 - 2)*
e^2)/(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2),
x))/(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b
^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1641 vs. $2(234) = 468$.

Time = 0.58 (sec) , antiderivative size = 1641, normalized size of antiderivative = 6.62

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 9/2*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x
+ c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 9
/2*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arc
sin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^
3*d) + 9*a*b*e^2*arcsin(d*x + c)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d
*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
+ 9*a*b*e^2*arcsin(d*x + c)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3
*d) - 27/8*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin
(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) + 9/2*a^2*e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*a
rcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8*b^2*e^2*arc
sin(d*x + c)^2*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d
*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 9/8*b^2*e^2*arcsin(d*x
 + c)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x
+ c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 9/2*a^2*e^2*cos(a/b)^2*si
n(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2
*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8*b^2*e^2*arcsin(d*x + c)^2*sin(a
/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*
d*arcsin(d*x + c) + a^2*b^3*d) + 3/2*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^2*ar
csin(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^
3*d) - 27/4*a*b*e^2*arcsin(d*x + c)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(
d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 1/4*a*b*e^2*arcsin(d*x + c)*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))
/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 9/4*a*
b*e^2*arcsin(d*x + c)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5
*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/4*a*b*e^2
*arcsin(d*x + c)*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin
(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 3/2*((d*x + c)^2 - 1
```

```
)*(d*x + c)*a*b*e^2/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
a^2*b^3*d) + 1/2*(d*x + c)*b^2*e^2*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c)^2
 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 27/8*a^2*e^2*cos(a/b)*cos_integ
ral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(
d*x + c) + a^2*b^3*d) - 1/8*a^2*e^2*cos(a/b)*cos_integral(a/b + arcsin(d*x
+ c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 9
/8*a^2*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d
*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8*a^2*e^2*sin(a/b)*s
in_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arc
sin(d*x + c) + a^2*b^3*d) + 1/2*(-(d*x + c)^2 + 1)^(3/2)*b^2*e^2/(b^5*d*arc
sin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*(d*x + c)*a*b
*e^2/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/
2*sqrt(-(d*x + c)^2 + 1)*b^2*e^2/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsi
n(d*x + c) + a^2*b^3*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^3}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^3, x)
```

3.230 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 157

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^3d} - \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^3d}$$

```
[Out] -1/2*e/b^2/d/(a+b*arcsin(d*x+c))+e*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))-e*co
s(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b^3/d+e*Ci(2*(a+b*arcsin(d*x+c))/b)*si
n(2*a/b)/b^3/d-1/2*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3384, 3380, 3383, 4737}

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = \frac{e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^3d} - \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^3d} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} - \frac{e\sqrt{1-(c+dx)^2}(c+dx)}{2bd(a+b\arcsin(c+dx))^2}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] -1/2*(e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^2) -
e/(2*b^2*d*(a + b*ArcSin[c + d*x])) + (e*(c + d*x)^2)/(b^2*d*(a + b*ArcSin[
c + d*x])) + (e*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b])/(b
^3*d) - (e*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/(b^3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{d}\\
&= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}+\frac{e\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{2bd}\\
&\quad -\frac{e\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{bd}\\
&= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}-\frac{e}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad +\frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))}-\frac{(2e)\text{Subst}\left(\int \frac{x}{a+b\arcsin(x)}\,dx,x,c+dx\right)}{b^2d}
\end{aligned}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{(2e)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{(2e)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} - \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^3d} - \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^3d}$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.78

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = \frac{e\left(-\frac{b^2(c+dx)\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2} + \frac{b(-1+2(c+dx)^2)}{a+b\arcsin(c+dx)} + 2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right) - 2\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}\right.\right.\right.}{2b^3d}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^3,x]
```

[Out] (e*(-((b^2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2) + (b
(-1 + 2(c + d*x)^2))/(a + b*ArcSin[c + d*x]) + 2*CosIntegral[2*(a/b + Arc
Sin[c + d*x])]*Sin[(2*a)/b] - 2*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c
+ d*x])]))/(2*b^3*d)

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.68

method	result
derivativedivides	$e\left(4\arcsin(dx+c)^2\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2-4\arcsin(dx+c)^2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2+8\arcsin(dx\right.$
default	$e\left(4\arcsin(dx+c)^2\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2-4\arcsin(dx+c)^2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2+8\arcsin(dx\right.$

[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)

[Out] 1/4/d*e*(4*arcsin(d*x+c)^2*sin(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^2-4*arcsi
n(d*x+c)^2*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b^2+8*arcsin(d*x+c)*sin(2*a
/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b-8*arcsin(d*x+c)*cos(2*a/b)*Si(2*arcsin(d*
x+c)+2*a/b)*a*b-2*arcsin(d*x+c)*cos(2*arcsin(d*x+c))*b^2+4*sin(2*a/b)*Ci(2*
arcsin(d*x+c)+2*a/b)*a^2-4*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a^2-2*cos(2
*arcsin(d*x+c))*a*b-sin(2*arcsin(d*x+c))*b^2)/(a+b*arcsin(d*x+c))^2/b^3

Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{dex+ce}{(b\arcsin(dx+c)+a)^3}\,dx$$

[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")

[Out] integral((d*e*x + c*e)/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 +
 3*a^2*b*arcsin(d*x + c) + a^3), x)

Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = e\left(\int \frac{c}{a^3+3a^2b\,\mathrm{asin}\,(c+dx)+3ab^2\,\mathrm{asin}^2\,(c+dx)+b^3\,\mathrm{asin}^3\,(c+dx)}\,dx + \int \frac{dx}{a^3+3a^2b\,\mathrm{asin}\,(c+dx)+3ab^2\,\mathrm{asin}^2\,(c+dx)+b^3\,\mathrm{asin}^3\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**3,x)
```

```
[Out] e*(Integral(c/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 +
b**3*asin(c + d*x)**3), x) + Integral(d*x/(a**3 + 3*a**2*b*asin(c + d*x) +
3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^3} \, dx = \int \frac{dex + ce}{(b \arcsin(dx + c) + a)^3} \, dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*a*d^2*e*x^2 + 4*a*c*d*e*x - (b*d*e*x + b*c*e)*sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1) + (2*a*c^2 - a)*e + (2*b*d^2*e*x^2 + 4*b*c*d*e*x + (2*b*c^2
- b)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*a
rctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2
(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate(2*(d
*e*x + c*e)/(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a
*b^2), x))/(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2
+ 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^
2*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 888 vs. $2(151) = 302$.

Time = 0.50 (sec) , antiderivative size = 888, normalized size of antiderivative = 5.66

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^3} \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 2*b^2*e*arcsin(d*x + c)^2*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*
sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
- 2*b^2*e*arcsin(d*x + c)^2*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x +
c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 4*a
*b*e*arcsin(d*x + c)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a
/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 4*a
*b*e*arcsin(d*x + c)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*a^2*e*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x +
 c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + b^2*e*arcsin(d*x + c)^2*si
n_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*
```

```
arcsin(d*x + c) + a^2*b^3*d) - 2*a^2*e*cos(a/b)^2*sin_integral(2*a/b + 2*ar
csin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b
^3*d) + ((d*x + c)^2 - 1)*b^2*e*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c)^2 +
2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*a*b*e*arcsin(d*x + c)*sin_integr
al(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d
*x + c) + a^2*b^3*d) - 1/2*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^2*e/(b^5*d*ar
csin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + ((d*x + c)^2 - 1
)*a*b*e/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) +
 1/2*b^2*e*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x
+ c) + a^2*b^3*d) + a^2*e*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*ar
csin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*a*b*e/(b^5*d
*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce + dex}{(a + b\arcsin(c + dx))^3}\,dx = \int \frac{c\,e + d\,e\,x}{(a + b\,\mathrm{asin}\,(c + d\,x))^3}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^3,x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^3, x)
```

3.231 $\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 127

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}+\frac{c+dx}{2b^2d(a+b\arcsin(c+dx))} - \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d} - \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d}$$

```
[Out] 1/2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))-1/2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b
)/b^3/d-1/2*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^3/d-1/2*(1-(d*x+c)^2)^(1/2
)/b/d/(a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4887, 4717, 4807, 4719, 3384, 3380, 3383}

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d} - \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d}+\frac{c+dx}{2b^2d(a+b\arcsin(c+dx))} - \frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-3),x]
```

```
[Out] -1/2*Sqrt[1 - (c + d*x)^2]/(b*d*(a + b*ArcSin[c + d*x])^2) + (c + d*x)/(2*b
^2*d*(a + b*ArcSin[c + d*x])) - (Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x
])/b])/(2*b^3*d) - (Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/(2*b^3
*d)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{2bd}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{c+dx}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad - \frac{\text{Subst}\left(\int \frac{1}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{2b^2d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{c+dx}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad - \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{c+dx}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}\\
&\quad - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^3d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} + \frac{c+dx}{2b^2d(a+b\arcsin(c+dx))}\\
&\quad - \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d} - \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.80

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{\frac{b^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}-\frac{b(c+dx)}{a+b\arcsin(c+dx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(c+\right.}{2b^3d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-3),x]
```

```
[Out] -1/2*((b^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2 - (b*(c + d*x))
/(a + b*ArcSin[c + d*x]) + Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] + Si
n[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(b^3*d)
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.24

method	result
derivativedivides	$\frac{-\frac{\sqrt{1-(dx+c)^2}}{2(a+b\arcsin(dx+c))^2 b}-\frac{\arcsin(dx+c)\,\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+\text{Ci}\left(\arcsin(dx+\right.}{2(a+b\arcsin(dx+c))b^3}}{d}$
default	$\frac{-\frac{\sqrt{1-(dx+c)^2}}{2(a+b\arcsin(dx+c))^2 b}-\frac{\arcsin(dx+c)\,\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+\text{Ci}\left(\arcsin(dx+\right.}{2(a+b\arcsin(dx+c))b^3}}{d}$

```
[In] int(1/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/2*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^2/b-1/2*(arcsin(d*x+c)*Ci
(arcsin(d*x+c)+a/b)*cos(a/b)*b+arcsin(d*x+c)*sin(a/b)*Si(arcsin(d*x+c)+a/b)
*b+Ci(arcsin(d*x+c)+a/b)*cos(a/b)*a+sin(a/b)*Si(arcsin(d*x+c)+a/b)*a-(d*x+c
)*b)/(a+b*arcsin(d*x+c))/b^3)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{\left(b\arcsin\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arc
sin(d*x + c) + a^3), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{\left(a+b\operatorname{asin}\left(c+dx\right)\right)^3}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**3,x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-3), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{\left(b\arcsin\left(dx+c\right)+a\right)^3}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(a*d*x - sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b + a*c + (b*d*x + b*c)*a
rctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(d*
x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c,
 sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate(1/2/(b^3*arct
an2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*d*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d
*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 547 vs. $2(117) = 234$.

Time = 0.31 (sec) , antiderivative size = 547, normalized size of antiderivative = 4.31

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{b^2\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{b^2\arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{ab\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d} - \frac{ab\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d} + \frac{(dx+c)b^2\arcsin(dx+c)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{a^2\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{a^2\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} + \frac{(dx+c)ab}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{\sqrt{-(dx+c)^2+1}b^2}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2*b^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*b^2*ar
csin(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(
d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - a*b*arcsin(d*x + c)*c
os(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*
b^4*d*arcsin(d*x + c) + a^2*b^3*d) - a*b*arcsin(d*x + c)*sin(a/b)*sin_integ
ral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x
+ c) + a^2*b^3*d) + 1/2*(d*x + c)*b^2*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c
)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*a^2*cos(a/b)*cos_integra
l(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x +
c) + a^2*b^3*d) - 1/2*a^2*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5
*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 1/2*(d*x +
c)*a*b/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) -
1/2*sqrt(-(d*x + c)^2 + 1)*b^2/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(
d*x + c) + a^2*b^3*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^3}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^3,x)
```

```
[Out] int(1/(a + b*asin(c + d*x))^3, x)
```

3.232 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^3},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^3,x)/e
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^3), x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\operatorname{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{d}\\ &= \frac{\operatorname{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 1.30 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.68 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\,(a+b\arcsin\,(dx+c))^3}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 91, normalized size of antiderivative = 3.96

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(dex+ce)(b\arcsin\,(dx+c)+a)^3}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
[Out] integral(1/(a^3*d*e*x + a^3*c*e + (b^3*d*e*x + b^3*c*e)*arcsin(d*x + c)^3 +
 3*(a*b^2*d*e*x + a*b^2*c*e)*arcsin(d*x + c)^2 + 3*(a^2*b*d*e*x + a^2*b*c*e
)*arcsin(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 3.61 (sec) , antiderivative size = 112, normalized size of antiderivative = 4.87

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \frac{\int \frac{1}{a^3c+a^3dx+3a^2bc\,\mathrm{asin}\,(c+dx)+3a^2bdx\,\mathrm{asin}\,(c+dx)+3ab^2c\,\mathrm{asin}^2\,(c+dx)+3ab^2dx\,\mathrm{asin}^2\,(c+dx)+b^3c\,\mathrm{asin}^3\,(c+dx)+b^3dx\,\mathrm{asin}^3\,(c+dx)}\,dx}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**3,x)
```

```
[Out] Integral(1/(a**3*c + a**3*d*x + 3*a**2*b*c*asin(c + d*x) + 3*a**2*b*d*x*asi
n(c + d*x) + 3*a*b**2*c*asin(c + d*x)**2 + 3*a*b**2*d*x*asin(c + d*x)**2 +
b**3*c*asin(c + d*x)**3 + b**3*d*x*asin(c + d*x)**3), x)/e
```

Maxima [N/A]

Not integrable

Time = 196.97 (sec) , antiderivative size = 520, normalized size of antiderivative = 22.61

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2*((b*d*x + b*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - b*arctan2(d*x +
c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(a^2*b^2*d^3*e*x^2 + 2*a^2*b^2
*c*d^2*e*x + a^2*b^2*c^2*d*e + (b^4*d^3*e*x^2 + 2*b^4*c*d^2*e*x + b^4*c^2*d
*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*(a*b^3*d^3
*e*x^2 + 2*a*b^3*c*d^2*e*x + a*b^3*c^2*d*e)*arctan2(d*x + c, sqrt(d*x + c +
 1)*sqrt(-d*x - c + 1)))*integrate(1/(a*b^2*d^3*e*x^3 + 3*a*b^2*c*d^2*e*x^2
 + 3*a*b^2*c^2*d*e*x + a*b^2*c^3*e + (b^3*d^3*e*x^3 + 3*b^3*c*d^2*e*x^2 + 3
*b^3*c^2*d*e*x + b^3*c^3*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1))), x) - a)/(a^2*b^2*d^3*e*x^2 + 2*a^2*b^2*c*d^2*e*x + a^2*b^2*c^2*d*
e + (b^4*d^3*e*x^2 + 2*b^4*c*d^2*e*x + b^4*c^2*d*e)*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*(a*b^3*d^3*e*x^2 + 2*a*b^3*c*d^2*e*x
+ a*b^3*c^2*d*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))
```

Giac [N/A]

Not integrable

Time = 7.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^3}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^3), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^3),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^3), x)
```

3.233 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 416

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = & -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2}\\ & +\frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2}-\frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))}\\ & +\frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))}\\ & -\frac{e^4\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{48b^4d}\\ & +\frac{27e^4\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32b^4d}\\ & -\frac{125e^4\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{96b^4d}\\ & +\frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{48b^4d}\\ & -\frac{27e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^4d}\\ & +\frac{125e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{96b^4d}\end{aligned}$$

```
[Out] -2/3*e^4*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))^2+5/6*e^4*(d*x+c)^5/b^2/d/(a+b
*arcsin(d*x+c))^2+1/48*e^4*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^4/d-27/32*e
^4*cos(3*a/b)*Si(3*(a+b*arcsin(d*x+c))/b)/b^4/d+125/96*e^4*cos(5*a/b)*Si(5*
```

```
(a+b*arcsin(d*x+c))/b)/b^4/d-1/48*e^4*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^
4/d+27/32*e^4*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^4/d-125/96*e^4*Ci(5*
(a+b*arcsin(d*x+c))/b)*sin(5*a/b)/b^4/d-1/3*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/
2)/b/d/(a+b*arcsin(d*x+c))^3-2*e^4*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b
*arcsin(d*x+c))+25/6*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*
x+c))
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4889, 12, 4729, 4807, 4727, 3384, 3380, 3383}

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = &-\frac{e^4\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{48b^4d} \\ &+\frac{27e^4\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^4d} \\ &-\frac{125e^4\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{96b^4d} \\ &+\frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{48b^4d} \\ &-\frac{27e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^4d} \\ &+\frac{125e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{96b^4d} \\ &+\frac{25e^4\sqrt{1-(c+dx)^2}(c+dx)^4}{6b^3d(a+b\arcsin(c+dx))} \\ &-\frac{2e^4\sqrt{1-(c+dx)^2}(c+dx)^2}{b^3d(a+b\arcsin(c+dx))}+\frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2} \\ &-\frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2}-\frac{e^4\sqrt{1-(c+dx)^2}(c+dx)^4}{3bd(a+b\arcsin(c+dx))^3}\end{aligned}$$

```
[In] Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] -1/3*(e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^3
) - (2*e^4*(c + d*x)^3)/(3*b^2*d*(a + b*ArcSin[c + d*x])^2) + (5*e^4*(c + d
*x)^5)/(6*b^2*d*(a + b*ArcSin[c + d*x])^2) - (2*e^4*(c + d*x)^2*Sqrt[1 - (c
 + d*x)^2])/(b^3*d*(a + b*ArcSin[c + d*x])) + (25*e^4*(c + d*x)^4*Sqrt[1 -
(c + d*x)^2])/(6*b^3*d*(a + b*ArcSin[c + d*x])) - (e^4*CosIntegral[(a + b*A
rcSin[c + d*x])/b]*Sin[a/b])/(48*b^4*d) + (27*e^4*CosIntegral[(3*(a + b*Arc
```

```
Sin[c + d*x]))/b]*Sin[(3*a)/b])/(32*b^4*d) - (125*e^4*CosIntegral[(5*(a + b
*ArcSin[c + d*x]))/b]*Sin[(5*a)/b])/(96*b^4*d) + (e^4*Cos[a/b]*SinIntegral[
(a + b*ArcSin[c + d*x])/b])/(48*b^4*d) - (27*e^4*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c + d*x]))/b])/(32*b^4*d) + (125*e^4*Cos[(5*a)/b]*SinIntegr
al[(5*(a + b*ArcSin[c + d*x]))/b])/(96*b^4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^4x^4}{(a+b\arcsin(x))^4}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{x^4}{(a+b\arcsin(x))^4}\,dx,x,c+dx\right)}{d}\\
&= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}+\frac{(4e^4)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{3bd}\\
&\quad-\frac{(5e^4)\,\text{Subst}\left(\int \frac{x^5}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{3bd}\\
&= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2}+\frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2}\\
&\quad+\frac{(2e^4)\,\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{b^2d}-\frac{(25e^4)\,\text{Subst}\left(\int \frac{x^4}{(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{6b^2d}\\
&= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2}\\
&\quad+\frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2}-\frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))}\\
&\quad+\frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))}\\
&\quad+\frac{(2e^4)\,\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(c+dx)\right)}{b^4d}\\
&\quad-\frac{(25e^4)\,\text{Subst}\left(\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{9\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx,x,a+b\arcsin(c+dx)\right)}{6b^4d}
\end{aligned}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} + \frac{e^4\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^4d} - \frac{(25e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{48b^4d} - \frac{(125e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{96b^4d} - \frac{(3e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^4d} + \frac{(75e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{32b^4d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} - \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^4d} + \frac{\left(25e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{48b^4d} + \frac{\left(3e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^4d} - \frac{\left(75e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{32b^4d} + \frac{\left(125e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{96b^4d} + \frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^4d} - \frac{\left(25e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{48b^4d} - \frac{\left(3e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{2b^4d} + \frac{\left(75e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{32b^4d} - \frac{\left(125e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(c+dx)\right)}{96b^4d}$$

$$= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2} - \frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} - \frac{e^4\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{48b^4d} + \frac{27e^4\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32b^4d} - \frac{125e^4\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{96b^4d} + \frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{48b^4d} - \frac{27e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^4d} + \frac{125e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{96b^4d}$$

Mathematica [A] (verified)

Time = 1.69 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.00

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \frac{e^4\left(-\frac{32b^3(c+dx)^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3} + \frac{16b^2(-4(c+dx)^3+5(c+dx)^5)}{(a+b\arcsin(c+dx))^2} + \frac{16b\sqrt{1-(c+dx)^2}(-12(c+dx)^2+25(c+dx)^4)}{a+b\arcsin(c+dx)} + 384(-\text{CosIntegr}}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e^4*((-32*b^3*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3
 + (16*b^2*(-4*(c + d*x)^3 + 5*(c + d*x)^5))/(a + b*ArcSin[c + d*x])^2 + (1
6*b*Sqrt[1 - (c + d*x)^2]*(-12*(c + d*x)^2 + 25*(c + d*x)^4))/(a + b*ArcSin
[c + d*x]) + 384*(-(CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b]) + Cos[a/b]
*SinIntegral[a/b + ArcSin[c + d*x]]) + 544*(3*CosIntegral[a/b + ArcSin[c +
d*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b] - 3*Co
s[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + Cos[(3*a)/b]*SinIntegral[3*(a/b
 + ArcSin[c + d*x])]) - 125*(10*CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b]
 - 5*CosIntegral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b] + CosIntegral[5*(a
/b + ArcSin[c + d*x])]*Sin[(5*a)/b] - 10*Cos[a/b]*SinIntegral[a/b + ArcSin[
c + d*x]] + 5*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])] - Cos[(5*
a)/b]*SinIntegral[5*(a/b + ArcSin[c + d*x])])))/(96*b^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1137 vs. 2(390) = 780.

Time = 0.91 (sec) , antiderivative size = 1138, normalized size of antiderivative = 2.74

method	result	size
derivativedivides	Expression too large to display	1138
default	Expression too large to display	1138

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/96/d*e^4*(2*arcsin(d*x+c)*b^3*(d*x+c)-2*cos(5*arcsin(d*x+c))*b^3-4*(1-(d*
x+c)^2)^(1/2)*b^3+6*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2*b-6*ar
csin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2*b+243*arcsin(d*x+c)^2*sin(3*
a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b^2-243*arcsin(d*x+c)^2*Si(3*arcsin(d*x+c)
+3*a/b)*cos(3*a/b)*a*b^2+243*arcsin(d*x+c)*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*
a/b)*a^2*b-243*arcsin(d*x+c)*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a^2*b+375
*arcsin(d*x+c)^2*Si(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)*a*b^2-375*arcsin(d*x+
c)^2*Ci(5*arcsin(d*x+c)+5*a/b)*sin(5*a/b)*a*b^2+375*arcsin(d*x+c)*Si(5*arcs
in(d*x+c)+5*a/b)*cos(5*a/b)*a^2*b-375*arcsin(d*x+c)*Ci(5*arcsin(d*x+c)+5*a/
b)*sin(5*a/b)*a^2*b+6*arcsin(d*x+c)^2*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a*b^2-
6*arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b^2+6*cos(3*arcsin(d*x+c
))*b^3+81*arcsin(d*x+c)^3*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*b^3-81*arcsi
n(d*x+c)^3*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*b^3-54*arcsin(d*x+c)*cos(3*
arcsin(d*x+c))*a*b^2+125*arcsin(d*x+c)^3*Si(5*arcsin(d*x+c)+5*a/b)*cos(5*a/
b)*b^3-125*arcsin(d*x+c)^3*Ci(5*arcsin(d*x+c)+5*a/b)*sin(5*a/b)*b^3+50*arcs
in(d*x+c)*cos(5*arcsin(d*x+c))*a*b^2+2*arcsin(d*x+c)^3*cos(a/b)*Si(arcsin(d
*x+c)+a/b)*b^3-2*arcsin(d*x+c)^3*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b^3+4*arcsi
n(d*x+c)*(1-(d*x+c)^2)^(1/2)*a*b^2-9*arcsin(d*x+c)*sin(3*arcsin(d*x+c))*b^3
+81*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^3-81*Si(3*arcsin(d*x+c)+3*a/b)*c
os(3*a/b)*a^3-9*sin(3*arcsin(d*x+c))*a*b^2-27*cos(3*arcsin(d*x+c))*a^2*b+25
*arcsin(d*x+c)^2*cos(5*arcsin(d*x+c))*b^3+5*arcsin(d*x+c)*sin(5*arcsin(d*x+
c))*b^3+125*Si(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)*a^3-125*Ci(5*arcsin(d*x+c)
+5*a/b)*sin(5*a/b)*a^3+25*cos(5*arcsin(d*x+c))*a^2*b+5*sin(5*arcsin(d*x+c))
*a*b^2+2*a*b^2*(d*x+c)+2*(1-(d*x+c)^2)^(1/2)*a^2*b+2*cos(a/b)*Si(arcsin(d*x
+c)+a/b)*a^3-2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^3+2*arcsin(d*x+c)^2*(1-(d*x
+c)^2)^(1/2)*b^3-27*arcsin(d*x+c)^2*cos(3*arcsin(d*x+c))*b^3)/(a+b*arcsin(d
*x+c))^3/b^4
```

Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin{(dx+c)}+a)^4}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x
 + c^4*e^4)/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*
arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

Sympy [F]

$$\begin{aligned}&\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx\\&=e^4\left(\int \frac{c^4}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right.\\&\quad+\int \frac{d^4x^4}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\\&\quad+\int \frac{4cd^3x^3}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\\&\quad+\int \frac{6c^2d^2x^2}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\\&\quad\left.+\int \frac{4c^3dx}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right)\end{aligned}$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**4,x)
```

```
[Out] e**4*(Integral(c**4/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d
*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(
d**4*x**4/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4
*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(4*c*d**3*x
**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**
3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(6*c**2*d**2*x**2
/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*a
sin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(4*c**3*d*x/(a**4 +
4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*asin(c + d
*x)**3 + b**4*asin(c + d*x)**4), x))
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5870 vs. $2(390) = 780$.

Time = 0.79 (sec) , antiderivative size = 5870, normalized size of antiderivative = 14.11

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
[Out] -125/6*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d
*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 +
3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/6*b^3*e^4*arcsin(d*x + c)^3*
cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3
 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) -
 125/2*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin
(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
+ 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/2*a*b^2*e^4*arcsin(d*x + c
)^2*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x +
c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*
d) + 125/8*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(5*a/b + 5*arcs
in(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^
2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/2*a^2*b*e^4*arcsin(d*x +
 c)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) + 27/8*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(3*a/b
+ 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d
*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 625/24*b^3*e^4*arcsi
n(d*x + c)^3*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) + 125/2*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)^5*sin_integral(5*a/b
 + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^
2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/8*b^3*e^4*arcsin(d*x + c)
^3*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c
)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d
```

) + 375/8*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/6*a^3*e^4*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 81/8*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 625/8*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/6*a^3*e^4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 81/8*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/96*b^3*e^4*arcsin(d*x + c)^3*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 375/8*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/32*b^3*e^4*arcsin(d*x + c)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 81/8*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/48*b^3*e^4*arcsin(d*x + c)^3*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 625/96*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 625/8*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 81/32*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 81/8*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/48*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 25/6*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 5/6*((d*x + c)^2 - 1)^2*(d*x + c)*b^3*e^4*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/32*a*b^2*e^4*arcsin(d*x + c)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6

*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/8*a^3
*e^4*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arc
sin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c)
+ a^3*b^4*d) - 81/32*a*b^2*e^4*arcsin(d*x + c)^2*cos_integral(3*a/b + 3*arc
sin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)
^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 27/8*a^3*e^4*cos(a/b)^2*cos
_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*
a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/16
*a*b^2*e^4*arcsin(d*x + c)^2*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(
b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(
d*x + c) + a^3*b^4*d) + 625/32*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)*sin_int
egral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsi
n(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 625/24*a^3*e^4*co
s(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 +
 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2
43/32*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*
x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*
d*arcsin(d*x + c) + a^3*b^4*d) - 27/8*a^3*e^4*cos(a/b)^3*sin_integral(3*a/b
 + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^
2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/16*a*b^2*e^4*arcsin(d*x +
c)^2*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3
+ 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) +
25/3*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*arcsin(d*x + c)/(
b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(
d*x + c) + a^3*b^4*d) - 19/3*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^4*arcsin(d*x +
c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*a
rcsin(d*x + c) + a^3*b^4*d) + 5/6*((d*x + c)^2 - 1)^2*(d*x + c)*a*b^2*e^4/(
b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(
d*x + c) + a^3*b^4*d) + ((d*x + c)^2 - 1)*(d*x + c)*b^3*e^4*arcsin(d*x + c)
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsi
n(d*x + c) + a^3*b^4*d) - 125/32*a^2*b*e^4*arcsin(d*x + c)*cos_integral(5*a
/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsi
n(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 81/32*a^2*b*e^4*a
rcsin(d*x + c)*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) - 1/16*a^2*b*e^4*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x
+ c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a
^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 625/32*a^2*b*e^4*arcsin(d*x + c)*co
s(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 243
/32*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x +
c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*ar
csin(d*x + c) + a^3*b^4*d) + 1/16*a^2*b*e^4*arcsin(d*x + c)*cos(a/b)*sin_in
tegral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d
*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 25/6*((d*x + c)^2 -

1)^2*sqrt(-(d*x + c)^2 + 1)*a^2*b*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*
arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3*((d*x +
c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b
^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 38/3*(-
(d*x + c)^2 + 1)^(3/2)*a*b^2*e^4*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 +
 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1
3/6*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)
^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
 + ((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6
*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*(d*x
+ c)*b^3*e^4*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*
x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/96*a^3*e^4*cos_in
tegral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b
^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/32*a
^3*e^4*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x +
 c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4
*d) - 1/48*a^3*e^4*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) + 625/96*a^3*e^4*cos(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c
))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arc
sin(d*x + c) + a^3*b^4*d) + 81/32*a^3*e^4*cos(a/b)*sin_integral(3*a/b + 3*a
rcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*
a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/48*a^3*e^4*cos(a/b)*sin_integral
(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c
)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 19/3*(-(d*x + c)^2 + 1)^(3
/2)*a^2*b*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^
2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^4
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsi
n(d*x + c) + a^3*b^4*d) + 13/3*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*arcsin(d*x
+ c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*a
rcsin(d*x + c) + a^3*b^4*d) + 1/6*(d*x + c)*a*b^2*e^4/(b^7*d*arcsin(d*x + c
)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d
) + 13/6*sqrt(-(d*x + c)^2 + 1)*a^2*b*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^
6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3*sqrt
(-(d*x + c)^2 + 1)*b^3*e^4/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x
+ c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{(c\,e+d\,e\,x)^4}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^4, x)
```

3.234 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 346

$$\begin{aligned}\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx =& -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2}\\&+\frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2}-\frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))}\\&+\frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))}\\&-\frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}\\&+\frac{4e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}\\&-\frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}\\&+\frac{4e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}\end{aligned}$$

```
[Out] -1/2*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^2+2/3*e^3*(d*x+c)^4/b^2/d/(a+b
*arcsin(d*x+c))^2-1/3*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^4/d+4/3*
e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*cos(4*a/b)/b^4/d-1/3*e^3*Si(2*(a+b*arcsin(d
*x+c))/b)*sin(2*a/b)/b^4/d+4/3*e^3*Si(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b
^4/d-1/3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^3-e^3*(d
*x+c)*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))+8/3*e^3*(d*x+c)^3*(1-(d
*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 346, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4889, 12, 4729, 4807, 4727, 3384, 3380, 3383}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{4e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} - \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{4e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{8e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{3b^3d(a+b\arcsin(c+dx))} - \frac{e^3\sqrt{1-(c+dx)^2}(c+dx)}{b^3d(a+b\arcsin(c+dx))} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{3bd(a+b\arcsin(c+dx))^3}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] -1/3*(e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^3
) - (e^3*(c + d*x)^2)/(2*b^2*d*(a + b*ArcSin[c + d*x])^2) + (2*e^3*(c + d*x
)^4)/(3*b^2*d*(a + b*ArcSin[c + d*x])^2) - (e^3*(c + d*x)*Sqrt[1 - (c + d*x
)^2])/(b^3*d*(a + b*ArcSin[c + d*x])) + (8*e^3*(c + d*x)^3*Sqrt[1 - (c + d*
x)^2])/(3*b^3*d*(a + b*ArcSin[c + d*x])) - (e^3*Cos[(2*a)/b]*CosIntegral[(2
*(a + b*ArcSin[c + d*x]))/b])/(3*b^4*d) + (4*e^3*Cos[(4*a)/b]*CosIntegral[(
4*(a + b*ArcSin[c + d*x]))/b])/(3*b^4*d) - (e^3*Sin[(2*a)/b]*SinIntegral[(2
*(a + b*ArcSin[c + d*x]))/b])/(3*b^4*d) + (4*e^3*Sin[(4*a)/b]*SinIntegral[(
4*(a + b*ArcSin[c + d*x]))/b])/(3*b^4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{e^3\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{bd} - \frac{(4e^3)\,\text{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{3bd}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{e^3\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{b^2d} - \frac{(8e^3)\,\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{3b^2d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^4d} - \frac{(8e^3)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{2x} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{(4e^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} - \frac{(4e^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} + \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^4d} + \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{b^4d}$$

$$= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{e^3\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^4d} + \frac{e^3\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^4d} - \frac{\left(4e^3\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} + \frac{\left(4e^3\cos\left(\frac{4a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} - \frac{\left(4e^3\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} + \frac{\left(4e^3\sin\left(\frac{4a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d}$$

$$
\begin{aligned}
&= -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} \\
&+ \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} \\
&+ \frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} \\
&+ \frac{4e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} \\
&- \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{4e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.26 (sec) , antiderivative size = 320, normalized size of antiderivative = 0.92

$$
\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx
$$

$$
= \frac{e^3\left(-\frac{2b^3(c+dx)^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3} + \frac{b^2(-3(c+dx)^2+4(c+dx)^4)}{(a+b\arcsin(c+dx))^2} + \frac{2b\sqrt{1-(c+dx)^2}(-3(c+dx)+8(c+dx)^3)}{a+b\arcsin(c+dx)} + 6\log(a+b\arcsin(c+dx\right.}{}
$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e^3*((-2*b^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3
+ (b^2*(-3*(c + d*x)^2 + 4*(c + d*x)^4))/(a + b*ArcSin[c + d*x])^2 + (2*b*S
qrt[1 - (c + d*x)^2]*(-3*(c + d*x) + 8*(c + d*x)^3))/(a + b*ArcSin[c + d*x]
) + 6*Log[a + b*ArcSin[c + d*x]] + 30*(Cos[(2*a)/b]*CosIntegral[2*(a/b + Ar
cSin[c + d*x])] - Log[a + b*ArcSin[c + d*x]] + Sin[(2*a)/b]*SinIntegral[2*(
a/b + ArcSin[c + d*x])]) + 8*(-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c
 + d*x])] + Cos[(4*a)/b]*CosIntegral[4*(a/b + ArcSin[c + d*x])] + 3*Log[a +
 b*ArcSin[c + d*x]] - 4*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])]
 + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x])])))/(6*b^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 782 vs. $2(324) = 648$.

Time = 0.33 (sec) , antiderivative size = 783, normalized size of antiderivative = 2.26

method	result	size
derivativedivides	Expression too large to display	783
default	Expression too large to display	783

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/24/d*e^3*(8*arcsin(d*x+c)^2*sin(4*arcsin(d*x+c))*b^3+2*arcsin(d*x+c)*cos
(2*arcsin(d*x+c))*b^3-2*arcsin(d*x+c)*cos(4*arcsin(d*x+c))*b^3+8*cos(2*a/b)
*Ci(2*arcsin(d*x+c)+2*a/b)*a^3+8*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^3-3
2*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*a^3-32*cos(4*a/b)*Ci(4*arcsin(d*x+c)
+4*a/b)*a^3-4*sin(2*arcsin(d*x+c))*a^2*b+2*cos(2*arcsin(d*x+c))*a*b^2+8*sin
(4*arcsin(d*x+c))*a^2*b-2*cos(4*arcsin(d*x+c))*a*b^2-4*arcsin(d*x+c)^2*sin(
2*arcsin(d*x+c))*b^3+24*arcsin(d*x+c)^2*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b
)*a*b^2+24*arcsin(d*x+c)^2*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a*b^2-96*ar
csin(d*x+c)^2*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*a*b^2-96*arcsin(d*x+c)^2
*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a*b^2+24*arcsin(d*x+c)*cos(2*a/b)*Ci(
2*arcsin(d*x+c)+2*a/b)*a^2*b+24*arcsin(d*x+c)*Si(2*arcsin(d*x+c)+2*a/b)*sin
(2*a/b)*a^2*b-96*arcsin(d*x+c)*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*a^2*b-9
6*arcsin(d*x+c)*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a^2*b+8*arcsin(d*x+c)^
3*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^3+8*arcsin(d*x+c)^3*Si(2*arcsin(d*
x+c)+2*a/b)*sin(2*a/b)*b^3-32*arcsin(d*x+c)^3*sin(4*a/b)*Si(4*arcsin(d*x+c)
+4*a/b)*b^3-32*arcsin(d*x+c)^3*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*b^3-8*a
rcsin(d*x+c)*sin(2*arcsin(d*x+c))*a*b^2+16*arcsin(d*x+c)*sin(4*arcsin(d*x+c
))*a*b^2-sin(4*arcsin(d*x+c))*b^3+2*sin(2*arcsin(d*x+c))*b^3)/(a+b*arcsin(d
*x+c))^3/b^4
```

Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^4}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^4*arc
sin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arcsin(d*x + c)^2 +
4*a^3*b*arcsin(d*x + c) + a^4), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= e^3\left(\int \frac{c^3}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{d^3x^3}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{3c^2dx}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**4,x)
```

```
[Out] e**3*(Integral(c**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d
*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(
d**3*x**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4
*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(3*c*d**2*x
**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**
3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(3*c**2*d*x/(a**4
 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*asin(c
+ d*x)**3 + b**4*asin(c + d*x)**4), x))
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4040 vs. $2(324) = 648$.

Time = 0.76 (sec) , antiderivative size = 4040, normalized size of antiderivative = 11.68

$$\int \frac{(ce + dex)^3}{(a + b \arcsin(c + dx))^4} \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
[Out] 32/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x
 + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d
*arcsin(d*x + c) + a^3*b^4*d) + 32/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^3*s
in(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 +
3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 32
*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x +
 c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*a
rcsin(d*x + c) + a^3*b^4*d) + 32*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^3*sin
(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*
a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 32/3
*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c
))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arc
sin(d*x + c) + a^3*b^4*d) + 32*a^2*b*e^3*arcsin(d*x + c)*cos(a/b)^4*cos_int
egral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsi
n(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2/3*b^3*e^3*arcsi
n(d*x + c)^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) - 16/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)*sin(a/b)*sin_integral
(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x
 + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 32*a^2*b*e^3*arcsin(d*
x + c)*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*a
rcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c
) + a^3*b^4*d) - 2/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)*sin(a/b)*sin_integr
al(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d
*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 32*a*b^2*e^3*arcsin(
d*x + c)^2*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin
(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a
^3*b^4*d) + 32/3*a^3*e^3*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c))
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsi
n(d*x + c) + a^3*b^4*d) - 2*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^2*cos_inte
gral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin
(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 16*a*b^2*e^3*arcsi
n(d*x + c)^2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7
*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x
 + c) + a^3*b^4*d) + 32/3*a^3*e^3*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b +
```

4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 8/3*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b^3*e^3*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 4/3*b^3*e^3*arcsin(d*x + c)^3*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 32*a^2*b*e^3*arcsin(d*x + c)*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/3*b^3*e^3*arcsin(d*x + c)^3*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2*a^2*b*e^3*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 16*a^2*b*e^3*arcsin(d*x + c)*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2*a^2*b*e^3*arcsin(d*x + c)*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 16/3*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b^2*e^3*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 5/3*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e^3*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*((d*x + c)^2 - 1)^2*b^3*e^3*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 4*a*b^2*e^3*arcsin(d*x + c)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 32/3*a^3*e^3*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + a*b^2*e^3*arcsin(d*x + c)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2/3*a^3*e^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 16/3*a^3*e^3*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2/3*a^3*e^3*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 8/3*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^2*b*e^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/3*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b^3*e^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 10/3*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a*b^2*e^3*arcs

```
in(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*
b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*((d*x + c)^2 - 1)^2*a*b^2*e^3/(b^7
*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x
 + c) + a^3*b^4*d) + 5/6*((d*x + c)^2 - 1)*b^3*e^3*arcsin(d*x + c)/(b^7*d*a
rcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c
) + a^3*b^4*d) + 4*a^2*b*e^3*arcsin(d*x + c)*cos_integral(4*a/b + 4*arcsin(
d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^
5*d*arcsin(d*x + c) + a^3*b^4*d) + a^2*b*e^3*arcsin(d*x + c)*cos_integral(2
*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x +
 c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 5/3*sqrt(-(d*x + c)^2 +
1)*(d*x + c)*a^2*b*e^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)
^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3*sqrt(-(d*x + c)^2 + 1)*
(d*x + c)*b^3*e^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 +
3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 5/6*((d*x + c)^2 - 1)*a*b^2*e^3/
(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin
(d*x + c) + a^3*b^4*d) + 1/6*b^3*e^3*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)
^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
 + 4/3*a^3*e^3*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x +
c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*
d) + 1/3*a^3*e^3*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x
+ c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^
4*d) + 1/6*a*b^2*e^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^4, x)
```

3.235 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4} dx$

Optimal result

Integrand size = 23, antiderivative size = 337

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx =& -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2} \\ &+ \frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} \\ &+ \frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))} \\ &- \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{24b^4d} \\ &+ \frac{9e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{8b^4d} \\ &+ \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^4d} \\ &- \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^4d}\end{aligned}$$

```
[Out] -1/3*e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^2+1/2*e^2*(d*x+c)^3/b^2/d/(a+b*a
rcsin(d*x+c))^2+1/24*e^2*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^4/d-9/8*e^2*c
os(3*a/b)*Si(3*(a+b*arcsin(d*x+c))/b)/b^4/d-1/24*e^2*Ci((a+b*arcsin(d*x+c))
/b)*sin(a/b)/b^4/d+9/8*e^2*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^4/d-1/3
*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^3-1/3*e^2*(1-(d*
x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))+3/2*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/
2)/b^3/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4889, 12, 4729, 4807, 4727, 3384, 3380, 3383, 4717, 4809}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^4d} + \frac{9e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^4d} + \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^4d} - \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^4d} + \frac{3e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{2b^3d(a+b\arcsin(c+dx))} - \frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{3bd(a+b\arcsin(c+dx))^3}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] -1/3*(e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^3
) - (e^2*(c + d*x))/(3*b^2*d*(a + b*ArcSin[c + d*x])^2) + (e^2*(c + d*x)^3)
/(2*b^2*d*(a + b*ArcSin[c + d*x])^2) - (e^2*Sqrt[1 - (c + d*x)^2])/(3*b^3*d
*(a + b*ArcSin[c + d*x])) + (3*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(2*b^
3*d*(a + b*ArcSin[c + d*x])) - (e^2*CosIntegral[(a + b*ArcSin[c + d*x])/b]*
Sin[a/b])/(24*b^4*d) + (9*e^2*CosIntegral[(3*(a + b*ArcSin[c + d*x]))/b]*Si
n[(3*a)/b])/(8*b^4*d) + (e^2*Cos[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b
])/(24*b^4*d) - (9*e^2*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))
/b])/(8*b^4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{(a+b\arcsin(x))^4}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^4}\,dx,x,c+dx\right)}{d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}+\frac{(2e^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{3bd}\\
&\quad-\frac{e^2\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx,x,c+dx\right)}{bd}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2}+\frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{3b^2d}-\frac{(3e^2)\,\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^2}\,dx,x,c+dx\right)}{2b^2d}\\
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2}\\
&\quad+\frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2}-\frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))}\\
&\quad+\frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))}\\
&\quad-\frac{(3e^2)\,\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{2b^4d}\\
&\quad-\frac{e^2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))}\,dx,x,c+dx\right)}{3b^3d}
\end{aligned}
$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))} + \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} - \frac{(3e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d} + \frac{(9e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d}$$

$$= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} + \frac{\left(3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d} - \frac{\left(9e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} - \frac{\left(3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d} + \frac{\left(9e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^4d}$$

$$
\begin{aligned}
&= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2} \\
&+ \frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2} - \frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} \\
&+ \frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))} - \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{24b^4d} \\
&+ \frac{9e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{8b^4d} \\
&+ \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^4d} - \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^4d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.26 (sec) , antiderivative size = 264, normalized size of antiderivative = 0.78

$$
\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \frac{e^2\left(-\frac{8b^3(c+dx)^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3} + \frac{4b^2(-2(c+dx)+3(c+dx)^3)}{(a+b\arcsin(c+dx))^2} + \frac{4b\sqrt{1-(c+dx)^2}(-2+9(c+dx)^2)}{a+b\arcsin(c+dx)} + 80\left(\text{CosIntegral}\left(\frac{a}{b}+\arcsin(\right.\right.\right.}{}
$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e^2*((-8*b^3*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3
+ (4*b^2*(-2*(c + d*x) + 3*(c + d*x)^3))/(a + b*ArcSin[c + d*x])^2 + (4*b*S
qrt[1 - (c + d*x)^2]*(-2 + 9*(c + d*x)^2))/(a + b*ArcSin[c + d*x]) + 80*(Co
sIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcS
in[c + d*x]]) + 27*(-3*CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + CosInt
egral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b] + 3*Cos[a/b]*SinIntegral[a/b
+ ArcSin[c + d*x]] - Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])])))
/(24*b^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 752 vs. $2(313) = 626$.

Time = 0.76 (sec) , antiderivative size = 753, normalized size of antiderivative = 2.23

method	result
derivativedivides	$\frac{e^2\left(\arcsin(dx+c)b^3(dx+c)-2\sqrt{1-(dx+c)^2}\,b^3+3\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)a^2b-3\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\mathrm{C}\right.}{}$
default	$\frac{e^2\left(\arcsin(dx+c)b^3(dx+c)-2\sqrt{1-(dx+c)^2}\,b^3+3\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)a^2b-3\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\mathrm{C}\right.}{}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/d*e^2*(arcsin(d*x+c)*b^3*(d*x+c)-2*(1-(d*x+c)^2)^(1/2)*b^3+3*arcsin(d*
x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2*b-3*arcsin(d*x+c)*sin(a/b)*Ci(arcsi
n(d*x+c)+a/b)*a^2*b+81*arcsin(d*x+c)^2*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)
*a*b^2-81*arcsin(d*x+c)^2*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a*b^2+81*arc
sin(d*x+c)*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2*b-81*arcsin(d*x+c)*Si(3
*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a^2*b+3*arcsin(d*x+c)^2*cos(a/b)*Si(arcsin
(d*x+c)+a/b)*a*b^2-3*arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b^2+2
*cos(3*arcsin(d*x+c))*b^3+27*arcsin(d*x+c)^3*sin(3*a/b)*Ci(3*arcsin(d*x+c)+
3*a/b)*b^3-27*arcsin(d*x+c)^3*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*b^3-18*a
rcsin(d*x+c)*cos(3*arcsin(d*x+c))*a*b^2+arcsin(d*x+c)^3*cos(a/b)*Si(arcsin(
d*x+c)+a/b)*b^3-arcsin(d*x+c)^3*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b^3+2*arcsin
(d*x+c)*(1-(d*x+c)^2)^(1/2)*a*b^2-3*arcsin(d*x+c)*sin(3*arcsin(d*x+c))*b^3+
27*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^3-27*Si(3*arcsin(d*x+c)+3*a/b)*co
s(3*a/b)*a^3-3*sin(3*arcsin(d*x+c))*a*b^2-9*cos(3*arcsin(d*x+c))*a^2*b+a*b^
2*(d*x+c)+(1-(d*x+c)^2)^(1/2)*a^2*b+cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^3-sin(
a/b)*Ci(arcsin(d*x+c)+a/b)*a^3+arcsin(d*x+c)^2*(1-(d*x+c)^2)^(1/2)*b^3-9*ar
csin(d*x+c)^2*cos(3*arcsin(d*x+c))*b^3)/(a+b*arcsin(d*x+c))^3/b^4
```

Fricas [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^4}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^4*arcsin(d*x + c)^4 + 4*a
*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x +
 c) + a^4), x)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= e^2\left(\int \frac{c^2}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right.$$
$$+\int \frac{d^2x^2}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx$$
$$\left.+\int \frac{2cdx}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**4,x)
```

```
[Out] e**2*(Integral(c**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d
*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(
d**2*x**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4
*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(2*c*d*x/(a
**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*asin
(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3109 vs. 2(313) = 626.

Time = 0.78 (sec) , antiderivative size = 3109, normalized size of antiderivative = 9.23

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 9/2*b^3*e^2*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x
+ c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a
^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 9/2*b^3*e^2*arcsin(d*x + c)^3*cos(a
```

/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*
a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 27/2
*a*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x +
 c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^
2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/2*a*b^2*e^2*arcsin(d*x + c)^2*cos
(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 +
3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 9/
8*b^3*e^2*arcsin(d*x + c)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b
)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcs
in(d*x + c) + a^3*b^4*d) + 27/2*a^2*b*e^2*arcsin(d*x + c)*cos(a/b)^2*cos_in
tegral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b
^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/24*b^
3*e^2*arcsin(d*x + c)^3*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d
*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x +
 c) + a^3*b^4*d) + 27/8*b^3*e^2*arcsin(d*x + c)^3*cos(a/b)*sin_integral(3*a
/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c
)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/2*a^2*b*e^2*arcsin(d*x
+ c)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x +
 c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4
*d) + 1/24*b^3*e^2*arcsin(d*x + c)^3*cos(a/b)*sin_integral(a/b + arcsin(d*x
 + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d
*arcsin(d*x + c) + a^3*b^4*d) - 27/8*a*b^2*e^2*arcsin(d*x + c)^2*cos_integr
al(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d
*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 9/2*a^3*e^2
*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(
d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^
3*b^4*d) - 1/8*a*b^2*e^2*arcsin(d*x + c)^2*cos_integral(a/b + arcsin(d*x +
c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2
*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 81/8*a*b^2*e^2*arcsin(d*x + c)^2*cos(
a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a
*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 9/2*a
^3*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x
 + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b
^4*d) + 1/8*a*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)*sin_integral(a/b + arcsin(
d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^
5*d*arcsin(d*x + c) + a^3*b^4*d) - 3/2*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2*arc
sin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a
^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/2*((d*x + c)^2 - 1)*(d*x + c)*b^3
*e^2*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/8*a^2*b*e^2*arcsin(d*x + c
)*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3
 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) -
 1/8*a^2*b*e^2*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsi
n(d*x + c) + a^3*b^4*d) + 81/8*a^2*b*e^2*arcsin(d*x + c)*cos(a/b)*sin_integ

```
ral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(
d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/8*a^2*b*e^2*arcsi
n(d*x + c)*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x +
 c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4
*d) - 3*(-(d*x + c)^2 + 1)^(3/2)*a*b^2*e^2*arcsin(d*x + c)/(b^7*d*arcsin(d*
x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*
b^4*d) + 7/6*sqrt(-(d*x + c)^2 + 1)*b^3*e^2*arcsin(d*x + c)^2/(b^7*d*arcsin
(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a
^3*b^4*d) + 1/2*((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^2/(b^7*d*arcsin(d*x + c
)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d
) + 1/6*(d*x + c)*b^3*e^2*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^
6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 9/8*a^3*
e^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)
^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
 - 1/24*a^3*e^2*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(
d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^
3*b^4*d) + 27/8*a^3*e^2*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b
^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d
*x + c) + a^3*b^4*d) + 1/24*a^3*e^2*cos(a/b)*sin_integral(a/b + arcsin(d*x
+ c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*
arcsin(d*x + c) + a^3*b^4*d) - 3/2*(-(d*x + c)^2 + 1)^(3/2)*a^2*b*e^2/(b^7*
d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x
+ c) + a^3*b^4*d) + 1/3*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2/(b^7*d*arcsin(d*x
+ c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^
4*d) + 7/3*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^2*arcsin(d*x + c)/(b^7*d*arcsin(d
*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3
*b^4*d) + 1/6*(d*x + c)*a*b^2*e^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcs
in(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 7/6*sqrt(-(d*x +
 c)^2 + 1)*a^2*b*e^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3*sqrt(-(d*x + c)^2 + 1)*b^
3*e^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*
arcsin(d*x + c) + a^3*b^4*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^4, x)
```

3.236 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 208

$$\begin{aligned}\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = & -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{e}{6b^2d(a+b\arcsin(c+dx))^2} \\ & +\frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2}+\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} \\ & -\frac{2e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} \\ & -\frac{2e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}\end{aligned}$$

```
[Out] -1/6*e/b^2/d/(a+b*arcsin(d*x+c))^2+1/3*e*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c)
)^2-2/3*e*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^4/d-2/3*e*Si(2*(a+b*arcs
in(d*x+c))/b)*sin(2*a/b)/b^4/d-1/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*a
rcsin(d*x+c))^3+2/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used

$= \{4889, 12, 4729, 4807, 4727, 3384, 3380, 3383, 4737\}$

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{2e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} - \frac{2e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{2e\sqrt{1-(c+dx)^2}(c+dx)}{3b^3d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} - \frac{e\sqrt{1-(c+dx)^2}(c+dx)}{3bd(a+b\arcsin(c+dx))^3}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] -1/3*(e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*d*(a + b*ArcSin[c + d*x])^3) -
e/(6*b^2*d*(a + b*ArcSin[c + d*x])^2) + (e*(c + d*x)^2)/(3*b^2*d*(a + b*Arc
Sin[c + d*x])^2) + (2*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(3*b^3*d*(a + b*Ar
cSin[c + d*x])) - (2*e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))
/b])/(3*b^4*d) - (2*e*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/
b])/(3*b^4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{e\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{3bd} - \frac{(2e)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{3bd}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{(2e)\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{3b^2d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{(2e)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{\left(2e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d} - \frac{\left(2e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^4d}$$

$$= -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{2e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} - \frac{2e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}$$

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.89

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$$
$$=\frac{e\left(-\frac{2b^3(c+dx)\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{b^2(-1+2(c+dx)^2)}{(a+b\arcsin(c+dx))^2}+\frac{4b(c+dx)\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)}-4\log(a+b\arcsin(c+dx))-4\left(\cos\left(\frac{2a}{b}\right)\mathrm{Co}\right.\right.}{6b^4d}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (e*((-2*b^3*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3 + (b
^2*(-1 + 2*(c + d*x)^2))/(a + b*ArcSin[c + d*x])^2 + (4*b*(c + d*x)*Sqrt[1
- (c + d*x)^2])/(a + b*ArcSin[c + d*x]) - 4*Log[a + b*ArcSin[c + d*x]] - 4*
(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] - Log[a + b*ArcSin[c +
 d*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])])))/(6*b^4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 398 vs. 2(192) = 384.

Time = 0.22 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.92

method	result
derivativedivides	$-\frac{e\left(4\arcsin(dx+c)^3\cos\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^3+4\arcsin(dx+c)^3\,\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b^3+12\arcsin(d\right.}{}$
default	$-\frac{e\left(4\arcsin(dx+c)^3\cos\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^3+4\arcsin(dx+c)^3\,\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b^3+12\arcsin(d\right.}{}$

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6/d*e*(4*arcsin(d*x+c)^3*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^3+4*arcs
in(d*x+c)^3*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*b^3+12*arcsin(d*x+c)^2*cos
(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b^2+12*arcsin(d*x+c)^2*Si(2*arcsin(d*x+
c)+2*a/b)*sin(2*a/b)*a*b^2-2*arcsin(d*x+c)^2*sin(2*arcsin(d*x+c))*b^3+12*ar
csin(d*x+c)*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^2*b+12*arcsin(d*x+c)*Si(
2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^2*b+arcsin(d*x+c)*cos(2*arcsin(d*x+c))*
b^3-4*arcsin(d*x+c)*sin(2*arcsin(d*x+c))*a*b^2+4*cos(2*a/b)*Ci(2*arcsin(d*x
+c)+2*a/b)*a^3+4*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^3+cos(2*arcsin(d*x+
c))*a*b^2-2*sin(2*arcsin(d*x+c))*a^2*b+sin(2*arcsin(d*x+c))*b^3)/(a+b*arcsi
n(d*x+c))^3/b^4
```

Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^4}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral((d*e*x + c*e)/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 +
 6*a^2*b^2*arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= e\left(\int \frac{c}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{dx}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**4,x)
```

```
[Out] e*(Integral(c/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2
 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(d*x/(a
**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*asin
(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

Maxima [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1665 vs. $2(192) = 384$.

Time = 0.74 (sec) , antiderivative size = 1665, normalized size of antiderivative = 8.00

$$\int \frac{ce + dex}{(a + b\arcsin(c + dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -4/3*b^3*e*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x +
 c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*a
rcsin(d*x + c) + a^3*b^4*d) - 4/3*b^3*e*arcsin(d*x + c)^3*cos(a/b)*sin(a/b)
*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6
*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 4*a*b^2*e
*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*
d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x
+ c) + a^3*b^4*d) - 4*a*b^2*e*arcsin(d*x + c)^2*cos(a/b)*sin(a/b)*sin_integ
ral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(
d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*b^3*e*arcsin(d*
x + c)^3*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 +
 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 4
*a^2*b*e*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsi
n(d*x + c) + a^3*b^4*d) - 4*a^2*b*e*arcsin(d*x + c)*cos(a/b)*sin(a/b)*sin_i
ntegral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arc
sin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*sqrt(-(d*x
+ c)^2 + 1)*(d*x + c)*b^3*e*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*
a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2*a*
b^2*e*arcsin(d*x + c)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) - 4/3*a^3*e*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/
(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin
(d*x + c) + a^3*b^4*d) - 4/3*a^3*e*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2
*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 +
3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 4/3*sqrt(-(d*x + c)^2 + 1)*(d*x
+ c)*a*b^2*e*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*
x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/3*((d*x + c)^2 - 1)
*b^3*e*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)
^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2*a^2*b*e*arcsin(d*x + c)*c
os_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d
*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*sqrt(-(
d*x + c)^2 + 1)*(d*x + c)*a^2*b*e/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcs
in(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3*sqrt(-(d*x +
 c)^2 + 1)*(d*x + c)*b^3*e/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x
```

```
+ c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/3*((d*x + c)^2 - 1)*a
*b^2*e/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d
*arcsin(d*x + c) + a^3*b^4*d) + 1/6*b^3*e*arcsin(d*x + c)/(b^7*d*arcsin(d*x
 + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b
^4*d) + 2/3*a^3*e*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x
 + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b
^4*d) + 1/6*a*b^2*e/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
+ 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{c\,e+d\,e\,x}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^4}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^4, x)
```

3.237 $\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 164

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}+\frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2}+\frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))}-\frac{\operatorname{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{6b^4d}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{6b^4d}$$

```
[Out] 1/6*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^2+1/6*cos(a/b)*Si((a+b*arcsin(d*x+c))
/b)/b^4/d-1/6*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^4/d-1/3*(1-(d*x+c)^2)^(1
/2)/b/d/(a+b*arcsin(d*x+c))^3+1/6*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x
+c))
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used

$= \{4887, 4717, 4807, 4809, 3384, 3380, 3383\}$

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{6b^4d} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{6b^4d} + \frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2} - \frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-4),x]
```

```
[Out] -1/3*Sqrt[1 - (c + d*x)^2]/(b*d*(a + b*ArcSin[c + d*x])^3) + (c + d*x)/(6*b
^2*d*(a + b*ArcSin[c + d*x])^2) + Sqrt[1 - (c + d*x)^2]/(6*b^3*d*(a + b*Arc
Sin[c + d*x])) - (CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/(6*b^4*d
) + (Cos[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/(6*b^4*d)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
```

```
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{3bd}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2}\\
&\quad - \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{6b^2d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2}\\
&\quad + \frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} + \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))}\,dx, x, c+dx\right)}{6b^3d}\\
&= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2}\\
&\quad + \frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{6b^4d}
\end{aligned}
$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} + \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{6b^4d} - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{6b^4d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} + \frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} - \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{6b^4d} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{6b^4d}$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \frac{-\frac{2b^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3} + \frac{b^2(c+dx)}{(a+b\arcsin(c+dx))^2} + \frac{b\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} - \text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) + \cos\left(\frac{a}{b}\right)}{6b^4d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-4),x]
```

```
[Out] ((-2*b^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3 + (b^2*(c + d*x))
/(a + b*ArcSin[c + d*x])^2 + (b*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*
x]) - CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + Cos[a/b]*SinIntegral[a/
b + ArcSin[c + d*x]])/(6*b^4*d)
```

Maple [A] (verified)

Time = 0.56 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.65

method	result
derivativedivides	$-\frac{\sqrt{1-(dx+c)^2}}{3(a+b\arcsin(dx+c))^3 b} + \frac{\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2 - \arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2 + 2\arcsin(d}{}$
default	$-\frac{\sqrt{1-(dx+c)^2}}{3(a+b\arcsin(dx+c))^3 b} + \frac{\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2 - \arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\text{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2 + 2\arcsin(d}{}$

```
[In] int(1/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/3*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^3/b+1/6*(arcsin(d*x+c)^2*
cos(a/b)*Si(arcsin(d*x+c)+a/b)*b^2-arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x+c
)+a/b)*b^2+2*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a*b-2*arcsin(d*x+
c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b+(1-(d*x+c)^2)^(1/2)*arcsin(d*x+c)*b^2
+cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2-sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2+(1-(
d*x+c)^2)^(1/2)*a*b+(d*x+c)*b^2)/(a+b*arcsin(d*x+c))^2/b^4)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{\left(b\arcsin\left(dx+c\right)+a\right)^4}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] integral(1/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*a
rcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+dx\right)\right)^4}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**4,x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-4), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\text{Timed out}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1112 vs. $2(150) = 300$.

Time = 0.31 (sec) , antiderivative size = 1112, normalized size of antiderivative = 6.78

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/6*b^3*arcsin(d*x + c)^3*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^
7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*
x + c) + a^3*b^4*d) + 1/6*b^3*arcsin(d*x + c)^3*cos(a/b)*sin_integral(a/b +
 arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 +
3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/2*a*b^2*arcsin(d*x + c)^2*cos_
integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6
*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/2*a*b^2
*arcsin(d*x + c)^2*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) - 1/2*a^2*b*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x + c))
*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^
5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/2*a^2*b*arcsin(d*x + c)*cos(a/b)*sin_i
ntegral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(
d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*sqrt(-(d*x + c)
^2 + 1)*b^3*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d
*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*(d*x + c)*b^3*ar
csin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^
2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/6*a^3*cos_integral(a/b + arcsin(d*
x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3
*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*a^3*cos(a/b)*sin_integral(a/b
 + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
+ 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/3*sqrt(-(d*x + c)^2 + 1)*a*b
^2*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 +
 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*(d*x + c)*a*b^2/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) +
 a^3*b^4*d) + 1/6*sqrt(-(d*x + c)^2 + 1)*a^2*b/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/3
*sqrt(-(d*x + c)^2 + 1)*b^3/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x
 + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^4}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^4,x)
[Out] int(1/(a + b*asin(c + d*x))^4, x)
```

3.238 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4} dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4} dx = \frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^4}, x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^4,x)/e
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4} dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4} dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4),x]
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^4), x], x, c + d*x]/(d*e)
```

Rubi steps

$$\text{integral} = \frac{\operatorname{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^4} dx, x, c+dx\right)}{d}$$

$$= \frac{\operatorname{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^4} dx, x, c+dx\right)}{de}$$

Mathematica [N/A]

Not integrable

Time = 15.14 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.27 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^4}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 121, normalized size of antiderivative = 5.26

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(dex+ce)(b\arcsin\left(dx+c\right)+a)^4}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
[Out] integral(1/(a^4*d*e*x + a^4*c*e + (b^4*d*e*x + b^4*c*e)*arcsin(d*x + c)^4 +
 4*(a*b^3*d*e*x + a*b^3*c*e)*arcsin(d*x + c)^3 + 6*(a^2*b^2*d*e*x + a^2*b^2
*c*e)*arcsin(d*x + c)^2 + 4*(a^3*b*d*e*x + a^3*b*c*e)*arcsin(d*x + c)), x)
```

Sympy [N/A]

Not integrable

Time = 7.76 (sec) , antiderivative size = 151, normalized size of antiderivative = 6.57

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx$$
$$=\frac{\int \frac{1}{a^4c+a^4dx+4a^3bc\operatorname{asin}(c+dx)+4a^3bdx\operatorname{asin}(c+dx)+6a^2b^2c\operatorname{asin}^2(c+dx)+6a^2b^2dx\operatorname{asin}^2(c+dx)+4ab^3c\operatorname{asin}^3(c+dx)+4ab^3dx\operatorname{asin}^3(c+dx)+b}}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**4,x)
```

```
[Out] Integral(1/(a**4*c + a**4*d*x + 4*a**3*b*c*asin(c + d*x) + 4*a**3*b*d*x*asi
n(c + d*x) + 6*a**2*b**2*c*asin(c + d*x)**2 + 6*a**2*b**2*d*x*asin(c + d*x)
**2 + 4*a*b**3*c*asin(c + d*x)**3 + 4*a*b**3*d*x*asin(c + d*x)**3 + b**4*c*
asin(c + d*x)**4 + b**4*d*x*asin(c + d*x)**4), x)/e
```

Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Giac [N/A]

Not integrable

Time = 21.19 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^4}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\ (a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^4),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^4), x)
```

3.239 $\int \frac{1}{(a+b \arcsin(c+dx))^5} \, dx$

Optimal result

Integrand size = 12, antiderivative size = 191

$$\int \frac{1}{(a+b \arcsin(c+dx))^5} \, dx = -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d}$$

```
[Out] 1/12*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^3+1/24*(-d*x-c)/b^4/d/(a+b*arcsin(d*
x+c))+1/24*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^5/d+1/24*Si((a+b*arcsin(d*x
+c))/b)*sin(a/b)/b^5/d-1/4*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^4+1/
24*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.583$, Rules used

$= \{4887, 4717, 4807, 4719, 3384, 3380, 3383\}$

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} - \frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-5),x]
```

```
[Out] -1/4*Sqrt[1 - (c + d*x)^2]/(b*d*(a + b*ArcSin[c + d*x])^4) + (c + d*x)/(12*
b^2*d*(a + b*ArcSin[c + d*x])^3) + Sqrt[1 - (c + d*x)^2]/(24*b^3*d*(a + b*A
rcSin[c + d*x])^2) - (c + d*x)/(24*b^4*d*(a + b*ArcSin[c + d*x])) + (Cos[a/
b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/(24*b^5*d) + (Sin[a/b]*SinIntegr
al[(a + b*ArcSin[c + d*x])/b])/(24*b^5*d)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^5}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^4}\,dx, x, c+dx\right)}{4bd}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} - \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^3}\,dx, x, c+dx\right)}{12b^2d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} + \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^2}\,dx, x, c+dx\right)}{24b^3d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\text{Subst}\left(\int \frac{1}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{24b^4d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{24b^5d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{24b^5d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(c+dx)\right)}{24b^5d}$$

$$= -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \frac{-\frac{6b^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^4} + \frac{2b^3(c+dx)}{(a+b\arcsin(c+dx))^3} + \frac{b^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2} - \frac{b(c+dx)}{a+b\arcsin(c+dx)} + \cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c\right.}{24b^5d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-5),x]
```

```
[Out] ((-6*b^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^4 + (2*b^3*(c + d*x
))/(a + b*ArcSin[c + d*x])^3 + (b^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c
+ d*x])^2 - (b*(c + d*x))/(a + b*ArcSin[c + d*x]) + Cos[a/b]*CosIntegral[a/
b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(24*b^5
*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 386 vs. $2(178) = 356$.

Time = 0.52 (sec) , antiderivative size = 387, normalized size of antiderivative = 2.03

method	result
derivativedivides	$-\frac{\sqrt{1-(dx+c)^2}}{4(a+b\arcsin(dx+c))^4 b}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+3\sin\left(\frac{a}{b}\right)}{}$
default	$-\frac{\sqrt{1-(dx+c)^2}}{4(a+b\arcsin(dx+c))^4 b}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+3\sin\left(\frac{a}{b}\right)}{}$

```
[In] int(1/(a+b*arcsin(d*x+c))^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(-1/4*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^4/b+1/24*(sin(a/b)*Si(arc
sin(d*x+c)+a/b)*arcsin(d*x+c)^3*b^3+cos(a/b)*Ci(arcsin(d*x+c)+a/b)*arcsin(d
*x+c)^3*b^3+3*sin(a/b)*Si(arcsin(d*x+c)+a/b)*arcsin(d*x+c)^2*a*b^2+3*cos(a/
b)*Ci(arcsin(d*x+c)+a/b)*arcsin(d*x+c)^2*a*b^2+3*sin(a/b)*Si(arcsin(d*x+c)+
a/b)*arcsin(d*x+c)*a^2*b+3*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*arcsin(d*x+c)*a^2
*b-arcsin(d*x+c)^2*b^3*(d*x+c)+(1-(d*x+c)^2)^(1/2)*arcsin(d*x+c)*b^3+sin(a/
b)*Si(arcsin(d*x+c)+a/b)*a^3+cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a^3-2*arcsin(d*
x+c)*a*b^2*(d*x+c)+(1-(d*x+c)^2)^(1/2)*a*b^2-a^2*b*(d*x+c)+2*(d*x+c)*b^3)/(
a+b*arcsin(d*x+c))^3/b^5)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^5}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] integral(1/(b^5*arcsin(d*x + c)^5 + 5*a*b^4*arcsin(d*x + c)^4 + 10*a^2*b^3*
arcsin(d*x + c)^3 + 10*a^3*b^2*arcsin(d*x + c)^2 + 5*a^4*b*arcsin(d*x + c)
+ a^5), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+dx))^5}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**5,x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-5), x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(a + b \arcsin(c + dx))^5} \, dx = \text{Timed out}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="maxima")
[Out] Timed out
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1915 vs. $2(175) = 350$.

Time = 0.31 (sec) , antiderivative size = 1915, normalized size of antiderivative = 10.03

$$\int \frac{1}{(a + b \arcsin(c + dx))^5} \, dx = \text{Too large to display}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="giac")
[Out] 1/24*b^4*arcsin(d*x + c)^4*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^
9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*
x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/24*b^4*arcsin(d*x +
 c)^4*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4
 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*
d*arcsin(d*x + c) + a^4*b^5*d) + 1/6*a*b^3*arcsin(d*x + c)^3*cos(a/b)*cos_i
ntegral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(
d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) +
a^4*b^5*d) + 1/6*a*b^3*arcsin(d*x + c)^3*sin(a/b)*sin_integral(a/b + arcsin
(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b
^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1/24*(d
*x + c)*b^4*arcsin(d*x + c)^3/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d
*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a
^4*b^5*d) + 1/4*a^2*b^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(a/b + arcsi
n(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*
b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/4*a^
2*b^2*arcsin(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^9*d
*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x +
 c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1/8*(d*x + c)*a*b^3*arcs
in(d*x + c)^2/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^
2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/6*
a^3*b*arcsin(d*x + c)*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^9*d*a
rcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c
)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/6*a^3*b*arcsin(d*x + c)*
sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a
```

```
*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcs
in(d*x + c) + a^4*b^5*d) + 1/24*sqrt(-(d*x + c)^2 + 1)*b^4*arcsin(d*x + c)^
2/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcs
in(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1/8*(d*x + c)*a^
2*b^2*arcsin(d*x + c)/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^
3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d
) + 1/12*(d*x + c)*b^4*arcsin(d*x + c)/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d
*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x
 + c) + a^4*b^5*d) + 1/24*a^4*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/
(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin
(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/24*a^4*sin(a/b)*
sin_integral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*ar
csin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x +
c) + a^4*b^5*d) + 1/12*sqrt(-(d*x + c)^2 + 1)*a*b^3*arcsin(d*x + c)/(b^9*d*
arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x +
c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1/24*(d*x + c)*a^3*b/(b^9
*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x
 + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/12*(d*x + c)*a*b^3/(
b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(
d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/24*sqrt(-(d*x + c
)^2 + 1)*a^2*b^2/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6
*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1
/4*sqrt(-(d*x + c)^2 + 1)*b^4/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d
*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a
^4*b^5*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx=\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^5}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^5,x)
[Out] int(1/(a + b*asin(c + d*x))^5, x)
```

3.240 $\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 288

$$\begin{aligned}\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx &= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}\\ &-\frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{64d}\\ &+\frac{\sqrt{b}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16d}\\ &+\frac{\sqrt{b}e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{16d}\\ &-\frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{64d}\end{aligned}$$

```
[Out] -1/128*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/d-1/128*e^3*FresnelS(2*2^(1/2)/Pi^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/
16*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^
(1/2)*Pi^(1/2)/d+1/16*e^3*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(
1/2))*sin(2*a/b)*b^(1/2)*Pi^(1/2)/d-3/32*e^3*(a+b*arcsin(d*x+c))^(1/2)/d+1/
4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4889, 12, 4725, 4809, 3393, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= -\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{64d} + \frac{\sqrt{\pi}\sqrt{b}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16d} + \frac{\sqrt{\pi}\sqrt{b}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16d} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{64d} + \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d} - \frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d}$$

```
[In] Int[(c*e + d*e*x)^3*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (-3*e^3*Sqrt[a + b*ArcSin[c + d*x]])/(32*d) + (e^3*(c + d*x)^4*Sqrt[a + b*A
rcSin[c + d*x]])/(4*d) - (Sqrt[b]*e^3*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC[(2*S
qrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(64*d) + (Sqrt[b]*e^3*Sqrt
[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi
])])/(16*d) + (Sqrt[b]*e^3*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]]
)/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(16*d) - (Sqrt[b]*e^3*Sqrt[Pi/2]*Fresne
lS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/(64*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
```

```
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int x^3\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}-\frac{(be^3)\,\text{Subst}\left(\int\frac{x^4}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{8d}\\
&= \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}-\frac{e^3\text{Subst}\left(\int\frac{\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8d}\\
&= \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}\\
&\quad-\frac{e^3\text{Subst}\left(\int\left(\frac{3}{8\sqrt{x}}+\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{8d}\\
&= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}\\
&\quad-\frac{e^3\text{Subst}\left(\int\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{64d}\\
&\quad+\frac{e^3\text{Subst}\left(\int\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16d}\\
&= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}\\
&\quad+\frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16d}\\
&\quad-\frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{64d}\\
&\quad+\frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16d}\\
&\quad-\frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{64d}
\end{aligned}$$

$$= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8d} - \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{32d} + \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8d} - \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{32d}$$

$$= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d} - \frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{64d} + \frac{\sqrt{b}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16d} + \frac{\sqrt{b}e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{16d} - \frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{64d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.88

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = -\frac{ibe^3e^{-\frac{4ia}{b}}\left(4\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right) - 4\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{2i(a+b\text{ ar}}{}\right.\right.}{128d\sqrt{a+b}}$$

```
[In] Integrate[(c*e + d*e*x)^3*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((-1/128*I)*b*e^3*(4*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d
*x]))/b]*Gamma[3/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 4*Sqrt[2]*E^(((6*
I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((2*I)*(a + b*ArcSi
n[c + d*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-4*I)
```

*(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.37

method	result
default	$-\frac{e^{3}\left(\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,b-\sin\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}}{}$

[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/128*e^3/d/(a+b*arcsin(d*x+c))^(1/2)*(cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*b-sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*b-8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+16*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+16*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a-4*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*arcsin(d*x+c)*b-4*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a)

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = e^3\left(\int c^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int d^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int 3cd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int 3c^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(1/2),x)
[Out] e**3*(Integral(c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(d**3*x**3*sqrt
(a + b*asin(c + d*x)), x) + Integral(3*c*d**2*x**2*sqrt(a + b*asin(c + d*x)
), x) + Integral(3*c**2*d*x*sqrt(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \int (dex+ce)^3\sqrt{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^3*sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.26 (sec) , antiderivative size = 1088, normalized size of antiderivative = 3.78

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/16*I*sqrt(pi)*a*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2
)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b))*d) + 1/128*sqrt(pi)*b^2*e^3*erf(-sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs
(b))*d) - 1/16*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c)
```

```
 + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*
I*a/b)/((sqrt(2)*b + I*sqrt(2)*b^2/abs(b))*d) + 1/128*sqrt(pi)*b^(3/2)*e^3*
erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b + I*sqrt(2)*b^2/abs(b
))*d) + 1/8*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(
b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/
abs(b))*d) - 1/32*sqrt(pi)*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^
2/abs(b))*d) - 1/8*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a
)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b
- I*b^2/abs(b))*d) - 1/32*sqrt(pi)*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c)
+ a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(
(b - I*b^2/abs(b))*d) + 1/16*I*sqrt(pi)*a*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))
*e^(4*I*a/b)/((sqrt(2)*sqrt(b) + I*sqrt(2)*b^(3/2)/abs(b))*d) + 1/8*I*sqrt(
pi)*a*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x +
c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d*(sqrt(b) - I*b^(3/2)/abs(b))) - 1/1
6*I*sqrt(pi)*a*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqr
t(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*sqr
t(b) - I*sqrt(2)*b^(3/2)/abs(b))*d) - 1/8*I*sqrt(pi)*a*e^3*erf(-sqrt(b*arcs
in(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^
(2*I*a/b)/(sqrt(b)*d*(I*b/abs(b) + 1)) + 1/64*sqrt(b*arcsin(d*x + c) + a)*e
^3*e^(4*I*arcsin(d*x + c))/d - 1/16*sqrt(b*arcsin(d*x + c) + a)*e^3*e^(2*I*
arcsin(d*x + c))/d - 1/16*sqrt(b*arcsin(d*x + c) + a)*e^3*e^(-2*I*arcsin(d*
x + c))/d + 1/64*sqrt(b*arcsin(d*x + c) + a)*e^3*e^(-4*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx=\int (c\,e+d\,e\,x)^3\,\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(1/2), x)
```

3.241 $\int (ce + dex)^2 \sqrt{a + b \arcsin(c + dx)}\, dx$

Optimal result

Integrand size = 25, antiderivative size = 274

$$\int (ce+dex)^2 \sqrt{a+b\arcsin(c+dx)}\,dx = \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d}$$

```
[Out] 1/72*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(
1/2))*b^(1/2)*6^(1/2)*Pi^(1/2)/d-1/72*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/d-1/8*e^2*c
os(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*b^(1/2
)*2^(1/2)*Pi^(1/2)/d+1/8*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/3*e^2*(d*x+c)^3*(a+b*a
rcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4889, 12, 4725, 4809, 3393, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d} + \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d}$$

```
[In] Int[(c*e + d*e*x)^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (e^2*(c + d*x)^3*Sqrt[a + b*ArcSin[c + d*x]])/(3*d) - (Sqrt[b]*e^2*Sqrt[Pi/
2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*
d) + (Sqrt[b]*e^2*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]])/(12*d) + (Sqrt[b]*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(4*d) - (Sqrt[b]*e^2*
Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(
3*a)/b])/(12*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
```

```
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^2x^2\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}$$

$$= \frac{e^2\text{Subst}\left(\int x^2\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{6d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{e^2\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{6d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{e^2\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{6d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{24d} + \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8d} + \frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{24d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8d} - \frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{24d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d} + \frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{12d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{4d} - \frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{12d}$$

$$= \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.32 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.91

$$\int(ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{be^2e^{-\frac{3ia}{b}}\left(9e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+9e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right.}{72d\sqrt{a+b\,\mathrm{arcs}}}$$

```
[In] Integrate[(c*e + d*e*x)^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (b*e^2*(9*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2,
 ((-I)*(a + b*ArcSin[c + d*x]))/b] + 9*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSi
n[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b] - Sqrt[3]*(Sqrt[(
```

```
(-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c + d*x])
)/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((3*I
)*(a + b*ArcSin[c + d*x]))/b])))/(72*d*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c
+ d*x]])
```

Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.44

method	result
default	$-\frac{e^2\left(-9\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-9\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{F}\right.}{}$

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/72*e^2/d/(a+b*arcsin(d*x+c))^(1/2)*(-9*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b)*b-9*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)/b)*b+(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(3
*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*b+(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(3*a/b)*Fresn
elC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+18*arcsi
n(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+18*sin(-(a+b*arcsin(d*x+c))/b+a/
b)*a-6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b-6*sin(-3*(a+b*ar
csin(d*x+c))/b+3*a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = e^2\left(\int c^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int d^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 2cdx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(1/2),x)
[Out] e**2*(Integral(c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(d**2*x**2*sqrt
(a + b*asin(c + d*x)), x) + Integral(2*c*d*x*sqrt(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int (dex+ce)^2\sqrt{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^2*sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.32 (sec) , antiderivative size = 1169, normalized size of antiderivative = 4.27

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/8*sqrt(2)*sqrt(pi)*a*b*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/16*I*sqrt(2)*sqrt(pi)*
b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(a
bs(b)) + b*sqrt(abs(b)))*d) + 1/8*sqrt(2)*sqrt(pi)*a*b*e^2*erf(1/2*I*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))
)*d) - 1/16*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
```

```
))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/4*sqrt(pi)*
a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*
sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b
 + I*sqrt(6)*b^2/abs(b))*d) - 1/24*I*sqrt(pi)*b^(3/2)*e^2*erf(-1/2*sqrt(6)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b + I*sqrt(6)*b^2/abs(b))*d) - 1
/4*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b
)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b))*d) + 1/24*I*sqrt(pi)*b^(3/2)*e^2*erf(
-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arc
sin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b - I*sqrt(6)*b^2/
abs(b))*d) + 1/4*sqrt(pi)*a*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*
I*a/b)/((sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*d) - 1/4*sqrt(pi)*a*e^
2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt
(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/4*sqrt(pi)*a*e^2*erf(1/2*I*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
 + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sq
rt(abs(b)))) + 1/4*sqrt(pi)*a*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(
-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b))*d) + 1/24*I*sqrt(b*
arcsin(d*x + c) + a)*e^2*e^(3*I*arcsin(d*x + c))/d - 1/8*I*sqrt(b*arcsin(d*
x + c) + a)*e^2*e^(I*arcsin(d*x + c))/d + 1/8*I*sqrt(b*arcsin(d*x + c) + a)
*e^2*e^(-I*arcsin(d*x + c))/d - 1/24*I*sqrt(b*arcsin(d*x + c) + a)*e^2*e^(-
3*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx=\int (c\,e+d\,e\,x)^2\,\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(1/2), x)
```

3.242 $\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 156

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = -\frac{e\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{\sqrt{b}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d} + \frac{\sqrt{b}e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d}$$

```
[Out] 1/8*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^(
1/2)*Pi^(1/2)/d+1/8*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2)
)*sin(2*a/b)*b^(1/2)*Pi^(1/2)/d-1/4*e*(a+b*arcsin(d*x+c))^(1/2)/d+1/2*e*(d*
x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules

used = {4889, 12, 4725, 4809, 3393, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \frac{\sqrt{\pi}\sqrt{b}e\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d} + \frac{\sqrt{\pi}\sqrt{b}e\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} - \frac{e\sqrt{a+b\arcsin(c+dx)}}{4d}$$

```
[In] Int[(c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] -1/4*(e*Sqrt[a + b*ArcSin[c + d*x]])/d + (e*(c + d*x)^2*Sqrt[a + b*ArcSin[c
 + d*x]])/(2*d) + (Sqrt[b]*e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*A
rcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*d) + (Sqrt[b]*e*Sqrt[Pi]*FresnelS[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d}-\frac{(be)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d}-\frac{e\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4d}
\end{aligned}$$

$$= \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} - \frac{e\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} - \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{4d}$$

$$= -\frac{e\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{e\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{8d} + \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{e\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d} + \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d}$$

$$= -\frac{e\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{\sqrt{b}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d} + \frac{\sqrt{b}e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.88

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \frac{ibee^{-\frac{2ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{8\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[(c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]],x]
```

[Out] ((I/8)*b*e*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b]) + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.30

method	result
default	$-\frac{e\left(-\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b+\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\mathrm{FresnelS}\left(\cdots\right.\right.}{8d\sqrt{a+b\arcsin(dx+c)}}$

[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/8*e/d/(a+b*arcsin(d*x+c))^(1/2)*(-(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+2*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a)

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = e\left(\int c\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(1/2),x)

[Out] e*(Integral(c*sqrt(a + b*asin(c + d*x)), x) + Integral(d*x*sqrt(a + b*asin(c + d*x)), x))

Maxima [F]

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx=\int (dex+ce)\sqrt{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.12 (sec) , antiderivative size = 488, normalized size of antiderivative = 3.13

$$\begin{aligned}
&\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx \\
&=\frac{i\sqrt{\pi}a\sqrt{b}e\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\left(b+\frac{ib^2}{|b|}\right)d} \\
&\quad-\frac{\sqrt{\pi}b^{\frac{3}{2}}e\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{16\left(b+\frac{ib^2}{|b|}\right)d} \\
&\quad-\frac{i\sqrt{\pi}a\sqrt{b}e\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\left(b-\frac{ib^2}{|b|}\right)d} \\
&\quad-\frac{\sqrt{\pi}b^{\frac{3}{2}}e\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{16\left(b-\frac{ib^2}{|b|}\right)d} \\
&\quad+\frac{i\sqrt{\pi}ae\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\,d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} \\
&\quad-\frac{i\sqrt{\pi}ae\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d\left(\frac{ib}{|b|}+1\right)} \\
&\quad-\frac{\sqrt{b\arcsin(dx+c)+a}\,ae e^{(2i\arcsin(dx+c))}}{8\,d}-\frac{\sqrt{b\arcsin(dx+c)+a}\,ae e^{(-2i\arcsin(dx+c))}}{8\,d}
\end{aligned}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/4*I*sqrt(pi)*a*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d)
```

```
 - 1/16*sqrt(pi)*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d)
 - 1/4*I*sqrt(pi)*a*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*
sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b)
)*d) - 1/16*sqrt(pi)*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I
*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b
))*d) + 1/4*I*sqrt(pi)*a*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d*(sqrt(b) - I*b^(3/
2)/abs(b))) - 1/4*I*sqrt(pi)*a*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
 I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d*(I*b/
abs(b) + 1)) - 1/8*sqrt(b*arcsin(d*x + c) + a)*e*e^(2*I*arcsin(d*x + c))/d
- 1/8*sqrt(b*arcsin(d*x + c) + a)*e*e^(-2*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx=\int (c\,e+d\,e\,x)\ \sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2), x)
```

3.243 $\int \sqrt{a+b \arcsin (c+d x)} \, dx$

Optimal result

Integrand size = 14, antiderivative size = 133

$$\int \sqrt{a+b \arcsin (c+d x)} \, dx = \frac{(c+d x) \sqrt{a+b \arcsin (c+d x)}}{d} - \frac{\sqrt{b} \sqrt{\frac{\pi}{2}} \cos \left(\frac{a}{b}\right) \text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}} \sqrt{a+b \arcsin (c+d x)}}{\sqrt{b}}\right)}{d} + \frac{\sqrt{b} \sqrt{\frac{\pi}{2}} \text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}} \sqrt{a+b \arcsin (c+d x)}}{\sqrt{b}}\right) \sin \left(\frac{a}{b}\right)}{d}$$

```
[Out] -1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*
b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+(d*x+c)*(a+b*arcsin(d*
x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4887, 4715, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \sqrt{a+b \arcsin (c+d x)} \, dx = \frac{\sqrt{\frac{\pi}{2}} \sqrt{b} \sin \left(\frac{a}{b}\right) \text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}} \sqrt{a+b \arcsin (c+d x)}}{\sqrt{b}}\right)}{d} - \frac{\sqrt{\frac{\pi}{2}} \sqrt{b} \cos \left(\frac{a}{b}\right) \text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}} \sqrt{a+b \arcsin (c+d x)}}{\sqrt{b}}\right)}{d} + \frac{(c+d x) \sqrt{a+b \arcsin (c+d x)}}{d}$$

```
[In] Int[Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/d - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/d + (Sqrt[b]*Sqrt
[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])
/d
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
```

```
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \sqrt{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{b\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$$= \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.04 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$=\frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c
 + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/
2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c +
d*x]])
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.53

method	result
default	$-\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}}{2d\sqrt{a+b\arcsin(dx+c)}}$

```
[In] int((a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d/(a+b*arcsin(d*x+c))^(1/2)*(-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*b-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*b+2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+b*arcsin(d
*x+c))/b+a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**(1/2),x)
[Out] Integral(sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin\,(dx+c)+a}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 563, normalized size of antiderivative = 4.23

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{\sqrt{2}\sqrt{\pi}ab\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{i\sqrt{2}\sqrt{\pi}b^2\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{\sqrt{2}\sqrt{\pi}ab\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{i\sqrt{2}\sqrt{\pi}b^2\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}a\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}a\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(i\arcsin(dx+c))}}{2d}+\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(-i\arcsin(dx+c))}}{2d}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/
b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/4*I*sqrt(2)*sqrt(pi)*b^2*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) +
b*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqr
t(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/4*I*
sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs
(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(
(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a*erf(-1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqr
t(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/
```

```
b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/2*I*sqrt(b*ar
csin(d*x + c) + a)*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) +
 a)*e^(-I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(1/2),x)
```

```
[Out] int((a + b*asin(c + d*x))^(1/2), x)
```

3.244 $\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \frac{\operatorname{Int}\left(\frac{\sqrt{a+b\arcsin(c+dx)}}{c+dx},x\right)}{e}$$

```
[Out] Unintegrable((a+b*arcsin(d*x+c))^(1/2)/(d*x+c),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$$

```
[In] Int[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x),x]
[Out] Defer[Subst][Defer[Int][Sqrt[a + b*ArcSin[x]]/x, x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int \frac{\sqrt{a+b\arcsin(x)}}{ex}\,dx,x,c+dx\right)}{d} \\ &= \frac{\text{Subst}\left(\int \frac{\sqrt{a+b\arcsin(x)}}{x}\,dx,x,c+dx\right)}{de} \end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.53 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x),x]
[Out] Integrate[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.60 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{a+b\arcsin\left(dx+c\right)}}{dex+ce}dx$$

```
[In] int((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x)
[Out] int((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.80

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\frac{\int \frac{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}{c+dx}\,dx}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**(1/2)/(d*e*x+c*e),x)
[Out] Integral(sqrt(a + b*asin(c + d*x))/(c + d*x), x)/e
```

Maxima [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\int \frac{\sqrt{b\arcsin\left(dx+c\right)+a}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

Giac [N/A]

Not integrable

Time = 1.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\int \frac{\sqrt{b\arcsin\left(dx+c\right)+a}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate(sqrt(b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\int \frac{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(1/2)/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^(1/2)/(c*e + d*e*x), x)
```

3.245 $\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 380

$$
\begin{aligned}
\int (ce+dex)^3(a&+b\arcsin(c+dx))^{3/2}\,dx = \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} \\
&+\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} \\
&-\frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} \\
&+\frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} \\
&-\frac{3b^{3/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{64d} \\
&+\frac{3b^{3/2}e^3\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{64d} \\
&-\frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{512d}
\end{aligned}
$$

```
[Out] -3/32*e^3*(a+b*arcsin(d*x+c))^(3/2)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))
^(3/2)/d+3/1024*b^(3/2)*e^3*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/1024*b^(3/2)*e^3*FresnelC(2
*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^
(1/2)/d-3/64*b^(3/2)*e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2)/Pi^(1/2))*Pi^(1/2)/d+3/64*b^(3/2)*e^3*FresnelC(2*(a+b*arcsin(d*x+c))^
(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+9/64*b*e^3*(d*x+c)*(1-(d*x+c)
```

```
^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d+3/32*b*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4889, 12, 4725, 4795, 4737, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{3\sqrt{\pi}b^{3/2}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{64d} - \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} + \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} - \frac{3\sqrt{\pi}b^{3/2}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{64d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{3be^3\sqrt{1-(c+dx)^2}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{9be^3\sqrt{1-(c+dx)^2}(c+dx)\sqrt{a+b\arcsin(c+dx)}}{64d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (9*b*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(64*d
) + (3*b*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])
/(32*d) - (3*e^3*(a + b*ArcSin[c + d*x])^(3/2))/(32*d) + (e^3*(c + d*x)^4*(
a + b*ArcSin[c + d*x])^(3/2))/(4*d) + (3*b^(3/2)*e^3*Sqrt[Pi/2]*Cos[(4*a)/b
]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(512*d) - (
3*b^(3/2)*e^3*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]]
)/(Sqrt[b]*Sqrt[Pi])])/(64*d) + (3*b^(3/2)*e^3*Sqrt[Pi]*FresnelC[(2*Sqrt[a
+ b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(64*d) - (3*b^(3/2)
*e^3*Sqrt[Pi/2]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]
]*Sin[(4*a)/b])/(512*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\ &= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\ &= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d}-\frac{(3be^3)\,\text{Subst}\left(\int \frac{x^4\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}\end{aligned}$$

$$=\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d}-\frac{(9be^3)\operatorname{Subst}\left(\int\frac{x^2\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{32d}-\frac{(3b^2e^3)\operatorname{Subst}\left(\int\frac{x^3}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{64d}$$

$$=\frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d}+\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{(3be^3)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{64d}-\frac{(9be^3)\operatorname{Subst}\left(\int\frac{\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{64d}-\frac{(9b^2e^3)\operatorname{Subst}\left(\int\frac{x}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{128d}$$

$$=\frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d}+\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d}-\frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{(3be^3)\operatorname{Subst}\left(\int\left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{64d}+\frac{(9be^3)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{128d}$$

$$= \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} - \frac{(3be^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d} + \frac{(3be^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d} + \frac{(9be^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{128d}$$

$$= \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{(9be^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d} - \frac{\left(3be^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d} + \frac{\left(3be^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d} + \frac{\left(3be^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d} - \frac{\left(3be^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d}$$

$$= \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} - \frac{\left(3be^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{128d} - \frac{\left(9be^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(c+dx)\right)}{256d} + \frac{\left(3be^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{256d} + \frac{\left(3be^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{128d} + \frac{\left(9be^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(c+dx)\right)}{256d} - \frac{\left(3be^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{256d}$$

$$= \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} - \frac{3b^{3/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d} + \frac{3b^{3/2}e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{256d} - \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{512d} - \frac{\left(9be^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{128d} + \frac{\left(9be^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{128d}$$

$$= \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} - \frac{3b^{3/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{64d} + \frac{3b^{3/2}e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{64d} - \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{512d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 252, normalized size of antiderivative = 0.66

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = -\frac{b^2e^3e^{-\frac{4ia}{b}}\left(-8\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-8\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},\frac{2i(a+b\arc}{}\right.\right.}{512d\sqrt{a+b\,a}}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] -1/512*(b^2*e^3*(-8*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*
x]))/b]*Gamma[5/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 8*Sqrt[2]*E^(((6*I
)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((2*I)*(a + b*ArcSin
[c + d*x]))/b] + Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((-4*I)*
(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x
]))/b]*Gamma[5/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I)*a)/b)*S
qrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 604, normalized size of antiderivative = 1.59

method	result
default	$-\frac{e^3\left(3\sqrt{a+b\arcsin(dx+c)}\,\mathrm{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{4a}{b}\right)\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^2+3\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{4a}{b}\right)\mathrm{FresnelC}\left(\frac{2}{}\right.\right.}{}$

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/1024*e^3/d*(3*(a+b*arcsin(d*x+c))^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*cos(4*a/b)*Pi^(1/2)*2^(1/2)*(-1/b)^(1
/2)*b^2+3*(a+b*arcsin(d*x+c))^(1/2)*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/
(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)*b^2
-48*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2
^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-48*(-1/b)^(1/
2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2+128*arcsin(d*x+c)^2*cos(-2*
(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-32*arcsin(d*x+c)^2*cos(-4*(a+b*arcsin(d*x+
c))/b+4*a/b)*b^2-12*arcsin(d*x+c)*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^2+2
56*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+96*arcsin(d*x+c)*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-64*arcsin(d*x+c)*cos(-4*(a+b*arcsin(
d*x+c))/b+4*a/b)*a*b-12*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a*b+128*cos(-2*
(a+b*arcsin(d*x+c))/b+2*a/b)*a^2+96*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b
-32*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a^2)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = e^3\left(\int ac^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int ad^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int bc^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 3acd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int 3ac^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int bd^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 3bcd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 3bc^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] e**3*(Integral(a*c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d**3*x**3*
sqrt(a + b*asin(c + d*x)), x) + Integral(b*c**3*sqrt(a + b*asin(c + d*x))*a
sin(c + d*x), x) + Integral(3*a*c*d**2*x**2*sqrt(a + b*asin(c + d*x)), x) +
 Integral(3*a*c**2*d*x*sqrt(a + b*asin(c + d*x)), x) + Integral(b*d**3*x**3
*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3*b*c*d**2*x**2*sqr
t(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3*b*c**2*d*x*sqrt(a + b
*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \int (dex+ce)^3(b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^3*(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.29 (sec) , antiderivative size = 2237, normalized size of antiderivative = 5.89

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/16*I*sqrt(pi)*a^2*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b
) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqr
t(2)*b^(5/2) + I*sqrt(2)*b^(7/2)/abs(b))*d) + 1/8*I*sqrt(pi)*a^2*b^2*e^3*er
f(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(5/2) - I*sqrt(2)*b^(7
/2)/abs(b))*d) + 1/64*sqrt(pi)*a*b^3*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-
4*I*a/b)/((sqrt(2)*b^(5/2) - I*sqrt(2)*b^(7/2)/abs(b))*d) - 1/8*I*sqrt(pi)*
a^2*b^(3/2)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b^2 + I
*sqrt(2)*b^3/abs(b))*d) + 1/64*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(2)*sqrt(b*a
rcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)
/abs(b))*e^(4*I*a/b)/((sqrt(2)*b^2 + I*sqrt(2)*b^3/abs(b))*d) + 1/8*I*sqrt(
pi)*a^2*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arc
sin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d) - 1/
16*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt
(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d
) - 1/8*I*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3
/abs(b))*d) - 1/16*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/
sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2
- I*b^3/abs(b))*d) - 1/16*I*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^2 - I*sqrt(2)*b^3/abs(b))*d) + 1/16*I*sqrt
(pi)*a^2*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b^(3/2)
+ I*sqrt(2)*b^(5/2)/abs(b))*d) - 1/64*sqrt(pi)*a*b^2*e^3*erf(-sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b^(3/2) + I*sqrt(2)*b^(5/2)/abs(b))*d) +
1/16*sqrt(pi)*a*b^2*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b
*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs
(b))*d) + 1/8*I*sqrt(pi)*a^2*b*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I
*b^(5/2)/abs(b))*d) + 1/16*sqrt(pi)*a*b^2*e^3*erf(-sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((
```

```
b^(3/2) - I*b^(5/2)/abs(b))*d) - 1/16*I*sqrt(pi)*a^2*b*e^3*erf(-sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sq
rt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b))*d)
 - 1/64*sqrt(pi)*a*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqr
t(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b))*d) + 3/1024*I*sqrt(pi)*b^3*e^3*erf
(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(3/2) - I*sqrt(2)*b^(5/
2)/abs(b))*d) - 3/1024*I*sqrt(pi)*b^(5/2)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))
*e^(4*I*a/b)/((sqrt(2)*b + I*sqrt(2)*b^2/abs(b))*d) - 1/8*I*sqrt(pi)*a^2*sq
rt(b)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x +
c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) + 3/128*I*sqrt(p
i)*b^(5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d
*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) - 3/128*I*s
qrt(pi)*b^(5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arc
sin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b))*d) + 1/6
4*sqrt(b*arcsin(d*x + c) + a)*b*e^3*arcsin(d*x + c)*e^(4*I*arcsin(d*x + c))
/d - 1/16*sqrt(b*arcsin(d*x + c) + a)*b*e^3*arcsin(d*x + c)*e^(2*I*arcsin(d
*x + c))/d - 1/16*sqrt(b*arcsin(d*x + c) + a)*b*e^3*arcsin(d*x + c)*e^(-2*I
*arcsin(d*x + c))/d + 1/64*sqrt(b*arcsin(d*x + c) + a)*b*e^3*arcsin(d*x + c
)*e^(-4*I*arcsin(d*x + c))/d + 1/64*sqrt(b*arcsin(d*x + c) + a)*a*e^3*e^(4*
I*arcsin(d*x + c))/d + 3/512*I*sqrt(b*arcsin(d*x + c) + a)*b*e^3*e^(4*I*arc
sin(d*x + c))/d - 1/16*sqrt(b*arcsin(d*x + c) + a)*a*e^3*e^(2*I*arcsin(d*x
+ c))/d - 3/64*I*sqrt(b*arcsin(d*x + c) + a)*b*e^3*e^(2*I*arcsin(d*x + c))/
d - 1/16*sqrt(b*arcsin(d*x + c) + a)*a*e^3*e^(-2*I*arcsin(d*x + c))/d + 3/6
4*I*sqrt(b*arcsin(d*x + c) + a)*b*e^3*e^(-2*I*arcsin(d*x + c))/d + 1/64*sqr
t(b*arcsin(d*x + c) + a)*a*e^3*e^(-4*I*arcsin(d*x + c))/d - 3/512*I*sqrt(b*
arcsin(d*x + c) + a)*b*e^3*e^(-4*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(3/2), x)
```

3.246 $\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 361

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{24d} - \frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d} + \frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{24d}$$

```
[Out] 1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(3/2)/d+1/144*b^(3/2)*e^2*cos(3*a/b)*
FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/
2)/d+1/144*b^(3/2)*e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d-3/16*b^(3/2)*e^2*cos(a/b)*FresnelC(2
^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/16*
b^(3/2)*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*si
n(a/b)*2^(1/2)*Pi^(1/2)/d+1/3*b*e^2*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))
```

```
^(1/2)/d+1/6*b*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
d
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.520$, Rules used = {4889, 12, 4725, 4795, 4767, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = -\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{\sqrt{\frac{\pi}{6}}b^{3/2}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{24d} - \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{\sqrt{\frac{\pi}{6}}b^{3/2}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{24d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} + \frac{be^2\sqrt{1-(c+dx)^2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d}$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (b*e^2*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(3*d) + (b*e^2*(c
 + d*x)^2*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(6*d) + (e^2*(
c + d*x)^3*(a + b*ArcSin[c + d*x])^(3/2))/(3*d) - (3*b^(3/2)*e^2*Sqrt[Pi/2]
*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(8*d)
 + (b^(3/2)*e^2*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Arc
Sin[c + d*x]])/Sqrt[b]])/(24*d) - (3*b^(3/2)*e^2*Sqrt[Pi/2]*FresnelS[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(8*d) + (b^(3/2)*e^2*
Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(
3*a)/b])/(24*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\ &= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\ &= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d}-\frac{(be^2)\,\text{Subst}\left(\int\frac{x^3\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\end{aligned}$$

$$= \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d}+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3d} - \frac{(b^2e^2)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{12d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{12d} - \frac{(b^2e^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{6d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{(be^2)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{12d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{6d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} + \frac{(be^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{48d} - \frac{(be^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{48d} - \frac{\left(be^2\cos\left(\frac{a}{b}\right)\right)\,\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{6d} - \frac{\left(be^2\sin\left(\frac{a}{b}\right)\right)\,\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{6d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{\left(be^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{48d} - \frac{\left(be^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3d} + \frac{\left(be^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{48d} - \frac{\left(be^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{48d} - \frac{\left(be^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3d} + \frac{\left(be^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{48d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{b^{3/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3d} - \frac{b^{3/2}e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3d} - \frac{\left(be^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{24d} + \frac{\left(be^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{24d} - \frac{\left(be^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{24d} + \frac{\left(be^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{24d}$$

$$= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d} + \frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d} - \frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{24d} - \frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d} + \frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{24d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.32 (sec) , antiderivative size = 268, normalized size of antiderivative = 0.74

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{be^2e^{-\frac{3ia}{b}}\sqrt{a+b\arcsin(c+dx)}\left(27e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+27e^{\frac{4ia}{b}}\sqrt{-\cdots}\right.}{\cdots}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (b*e^2*Sqrt[a + b*ArcSin[c + d*x]]*(27*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSi
n[c + d*x]))/b]*Gamma[5/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 27*E^(((4*I)
*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, (I*(a + b*ArcSin[c
 + d*x]))/b] - Sqrt[3]*(Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((-3
*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[
c + d*x]))/b]*Gamma[5/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(216*d*E^(((
3*I)*a)/b)*Sqrt[(a + b*ArcSin[c + d*x])^2/b^2])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 599 vs. $2(289) = 578$.

Time = 1.21 (sec) , antiderivative size = 600, normalized size of antiderivative = 1.66

method	result
default	$-\frac{e^2\left(-\sqrt{-\frac{3}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{3\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{3}{b}}\,b}\right)b^2+\sqrt{-\frac{3}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{3a}{b}\right)\mathrm{F}\right.}{}$

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/144*e^2/d*(-(-3/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(
3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
)*b^2+(-3/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(3*a/b)*Fr
esnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2+27*
(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-27*(a+b*arcsi
n(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+36*arcsin(d*x+c)^2*sin(
-(a+b*arcsin(d*x+c))/b+a/b)*b^2-12*arcsin(d*x+c)^2*sin(-3*(a+b*arcsin(d*x+c
))/b+3*a/b)*b^2+72*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-54*arc
sin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2-24*arcsin(d*x+c)*sin(-3*(a+b
*arcsin(d*x+c))/b+3*a/b)*a*b+6*arcsin(d*x+c)*cos(-3*(a+b*arcsin(d*x+c))/b+3
*a/b)*b^2+36*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-54*cos(-(a+b*arcsin(d*x+c)
)/b+a/b)*a*b-12*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^2+6*cos(-3*(a+b*arcsi
n(d*x+c))/b+3*a/b)*a*b)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce + dex)^2 (a + b\arcsin(c + dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = e^2\left(\int ac^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int ad^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bc^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2acdx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2bcdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] e**2*(Integral(a*c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d**2*x**2*
sqrt(a + b*asin(c + d*x)), x) + Integral(b*c**2*sqrt(a + b*asin(c + d*x))*a
sin(c + d*x), x) + Integral(2*a*c*d*x*sqrt(a + b*asin(c + d*x)), x) + Integ
ral(b*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(2*b*
c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.56 (sec) , antiderivative size = 2199, normalized size of antiderivative = 6.09

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)
*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/8*I*sqrt(2)*sqrt
(pi)*a*b^3*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
```

```
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3
/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/8*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf
(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b
^2*sqrt(abs(b)))*d) - 1/8*I*sqrt(2)*sqrt(pi)*a*b^3*e^2*erf(1/2*I*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
 + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*
d) - 1/4*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(
3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*d) - 1/12*I*sqrt(pi)*a*b^(5/
2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)
*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*
sqrt(6)*b^3/abs(b))*d) - 1/8*I*sqrt(2)*sqrt(pi)*a*b^2*e^2*erf(-1/2*I*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*
d) + 3/32*sqrt(2)*sqrt(pi)*b^3*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/8*I*sqrt(2)*sqrt
(pi)*a*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^
2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/32*sqrt(2)*sqrt(pi)*b^3*e^2*erf(1/2
*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqr
t(abs(b)))*d) - 1/4*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*d) + 1/12*I*sqrt
(pi)*a*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1
/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqr
t(6)*b^2 - I*sqrt(6)*b^3/abs(b))*d) + 1/4*sqrt(pi)*a^2*b*e^2*erf(-1/2*sqrt(
6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^(3/2) + I*sqrt(6)*b^(5/2)/a
bs(b))*d) + 1/12*I*sqrt(pi)*a*b^2*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))
*e^(3*I*a/b)/((sqrt(6)*b^(3/2) + I*sqrt(6)*b^(5/2)/abs(b))*d) - 1/4*sqrt(pi
)*a^2*b*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1
/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2
)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - 1/4*sqrt(pi)*a^2*b*e^2*er
f(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(ab
s(b)) + sqrt(2)*b*sqrt(abs(b)))*d) + 1/4*sqrt(pi)*a^2*b*e^2*erf(-1/2*sqrt(6
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^(3/2) - I*sqrt(6)*b^(5/2)/a
bs(b))*d) - 1/12*I*sqrt(pi)*a*b^2*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))
*e^(-3*I*a/b)/((sqrt(6)*b^(3/2) - I*sqrt(6)*b^(5/2)/abs(b))*d) - 1/48*sqrt(
```

```
pi)*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*
I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)
*b + I*sqrt(6)*b^2/abs(b))*d) - 1/48*sqrt(pi)*b^(5/2)*e^2*erf(-1/2*sqrt(6)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b))*d) +
1/24*I*sqrt(b*arcsin(d*x + c) + a)*b*e^2*arcsin(d*x + c)*e^(3*I*arcsin(d*x
+ c))/d - 1/8*I*sqrt(b*arcsin(d*x + c) + a)*b*e^2*arcsin(d*x + c)*e^(I*arcs
in(d*x + c))/d + 1/8*I*sqrt(b*arcsin(d*x + c) + a)*b*e^2*arcsin(d*x + c)*e^
(-I*arcsin(d*x + c))/d - 1/24*I*sqrt(b*arcsin(d*x + c) + a)*b*e^2*arcsin(d*
x + c)*e^(-3*I*arcsin(d*x + c))/d + 1/24*I*sqrt(b*arcsin(d*x + c) + a)*a*e^
2*e^(3*I*arcsin(d*x + c))/d - 1/48*sqrt(b*arcsin(d*x + c) + a)*b*e^2*e^(3*I
*arcsin(d*x + c))/d - 1/8*I*sqrt(b*arcsin(d*x + c) + a)*a*e^2*e^(I*arcsin(d
*x + c))/d + 3/16*sqrt(b*arcsin(d*x + c) + a)*b*e^2*e^(I*arcsin(d*x + c))/d
 + 1/8*I*sqrt(b*arcsin(d*x + c) + a)*a*e^2*e^(-I*arcsin(d*x + c))/d + 3/16*
sqrt(b*arcsin(d*x + c) + a)*b*e^2*e^(-I*arcsin(d*x + c))/d - 1/24*I*sqrt(b*
arcsin(d*x + c) + a)*a*e^2*e^(-3*I*arcsin(d*x + c))/d - 1/48*sqrt(b*arcsin(
d*x + c) + a)*b*e^2*e^(-3*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(3/2), x)
```

3.247 $\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 199

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{e(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d} - \frac{3b^{3/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d} + \frac{3b^{3/2}e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d}$$

```
[Out] -1/4*e*(a+b*arcsin(d*x+c))^(3/2)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(3/2
)/d-3/32*b^(3/2)*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/
Pi^(1/2))*Pi^(1/2)/d+3/32*b^(3/2)*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+3/8*b*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4889, 12, 4725, 4795, 4737, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx=\frac{3\sqrt{\pi}b^{3/2}e\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d}-\frac{3\sqrt{\pi}b^{3/2}e\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}+\frac{3be\sqrt{1-(c+dx)^2}(c+dx)\sqrt{a+b\arcsin(c+dx)}}{8d}-\frac{e(a+b\arcsin(c+dx))^{3/2}}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (3*b*e*(c + d*x)*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(8*d) -
 (e*(a + b*ArcSin[c + d*x])^(3/2))/(4*d) + (e*(c + d*x)^2*(a + b*ArcSin[c +
 d*x])^(3/2))/(2*d) - (3*b^(3/2)*e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a
 + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(32*d) + (3*b^(3/2)*e*Sqrt[Pi]*
FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/
(32*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}-\frac{(3be)\text{Subst}\left(\int \frac{x^2\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}\\
&\quad-\frac{(3be)\text{Subst}\left(\int \frac{\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}-\frac{(3b^2e)\,\text{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{16d}\\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}\\
&\quad-\frac{e(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}\\
&\quad+\frac{(3be)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16d}\\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}\\
&\quad-\frac{e(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}\\
&\quad+\frac{(3be)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16d}\\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}\\
&\quad-\frac{e(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d}\\
&\quad+\frac{(3be)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{32d}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\
&\quad - \frac{e(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d} \\
&\quad - \frac{\left(3be\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{32d} \\
&\quad + \frac{\left(3be\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{32d} \\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\
&\quad - \frac{e(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d} \\
&\quad - \frac{\left(3be\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d} \\
&\quad + \frac{\left(3be\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{16d} \\
&= \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\
&\quad - \frac{e(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d} \\
&\quad - \frac{3b^{3/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d} \\
&\quad + \frac{3b^{3/2}e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.09 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.69

$$
\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{b^2ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right.\right.}{16\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}
$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (b^2*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((-2*I)*(a + b*Ar
cSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Ga
```

```
mma[5/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(16*Sqrt[2]*d*E^(((2*I)*a)/b)
*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.55

method	result
default	$-\frac{e\left(-3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b^{2}-3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\operatorname{Fresn}}{}$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32*e/d/(a+b*arcsin(d*x+c))^(1/2)*(-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*b^2-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*si
n(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b)*b^2+8*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+16*arcsin
(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+6*arcsin(d*x+c)*sin(-2*(a+b
*arcsin(d*x+c))/b+2*a/b)*b^2+8*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2+6*si
n(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = e\left(\int ac\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int adx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bc\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int bdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] e*(Integral(a*c*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d*x*sqrt(a + b*a
sin(c + d*x)), x) + Integral(b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x
) + Integral(b*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce + dex)(a + b\arcsin(c + dx))^{3/2}\, dx = \int (dex + ce)(b\arcsin(dx + c) + a)^{\frac{3}{2}}\, dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 929, normalized size of antiderivative = 4.67

$$\int (ce + dex)(a + b\arcsin(c + dx))^{3/2}\, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*s
qrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b)
)*d) - 1/8*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs
(b))*d) - 1/4*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I
*b^3/abs(b))*d) - 1/8*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)
/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2
 - I*b^3/abs(b))*d) + 1/8*sqrt(pi)*a*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)
/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3
/2) + I*b^(5/2)/abs(b))*d) + 1/4*I*sqrt(pi)*a^2*b*e*erf(-sqrt(b*arcsin(d*x
+ c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a
/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) + 1/8*sqrt(pi)*a*b^2*e*erf(-sqrt(b*arc
sin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e
^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) - 1/4*I*sqrt(pi)*a^2*sqrt(b)*e
*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*s
qrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) + 3/64*I*sqrt(pi)*b^(5/2)
*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)
*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) - 3/64*I*sqrt(pi)*b^(5/
```

```
2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) +
a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b))*d) - 1/8*sqrt(b*arcsin(
d*x + c) + a)*b*e*arcsin(d*x + c)*e^(2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*ar
csin(d*x + c) + a)*b*e*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c))/d - 1/8*sqr
t(b*arcsin(d*x + c) + a)*a*e*e^(2*I*arcsin(d*x + c))/d - 3/32*I*sqrt(b*arcs
in(d*x + c) + a)*b*e*e^(2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c)
 + a)*a*e*e^(-2*I*arcsin(d*x + c))/d + 3/32*I*sqrt(b*arcsin(d*x + c) + a)*b
*e*e^(-2*I*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^{3/2}\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2), x)
```

3.248 $\int (a+b\arcsin(c+dx))^{3/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 175

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

```
[Out] (d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/P
i^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/4*b^(3/2)*F
resnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2
)*Pi^(1/2)/d+3/2*b*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {4887, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}+\frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (3*b*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(2*d) + ((c + d*x)*
(a + b*ArcSin[c + d*x])^(3/2))/d - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(2*d) - (3*b^(3/2)*Sqrt[
Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/
(2*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}-\frac{(3b)\text{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{2d}\\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}\\
&\quad-\frac{(3b^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}\\
&\quad-\frac{(3b)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4d}\\
&= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}\\
&\quad-\frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4d}\\
&\quad-\frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4d}
\end{aligned}
$$

$$= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d} - \frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2d}$$

$$= \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.79 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.78

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \frac{abe^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}} + \frac{\sqrt{b}\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\left(3b\cos\left(\frac{a}{b}\right)+2a\sin\left(\frac{a}{b}\right)\right)+\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\left(2a\cos\left(\frac{a}{b}\right)-3b\sin\left(\frac{a}{b}\right)\right)\right)}{4d}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (a*b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin
[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c
+ d*x]]) + (Sqrt[b]*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*Sqrt[1 - (c +
 d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b]) + Sqrt[2
*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(2*a*Cos[a/
b] - 3*b*Sin[a/b])))/(4*d)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 303 vs. 2(139) = 278.

Time = 0.35 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.74

method	result
default	$-\frac{3\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,b^2-3\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\,\mathrm{ar}}}{\sqrt{\pi}\,\sqrt{}}\right.}{}$

[In] int((a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/4/d*(3*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-3*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+4*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-6*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-6*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b*arcsin(d*x+c))^(1/2)

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \int (a+b\,\mathrm{asin}\,(c+dx))^{\frac{3}{2}}\,dx$$

[In] integrate((a+b*asin(d*x+c))**(3/2),x)

[Out] Integral((a + b*asin(c + d*x))**(3/2), x)

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.90 (sec) , antiderivative size = 1061, normalized size of antiderivative = 6.06

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)
*a*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(ab
s(b)) + b^2*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(
b)))*d) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 1/2*I*sqrt(
2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*
b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(-1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(ab
s(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)
*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2
/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a^2*b*erf(-1/2*I*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt
(abs(b)))*d) - sqrt(pi)*a^2*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
```

```
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - 1/2*I*
sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + 1/2
*I*sqrt(b*arcsin(d*x + c) + a)*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d -
 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(I*arcsin(d*x + c))/d + 3/4*sqrt(b*a
rcsin(d*x + c) + a)*b*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c
) + a)*a*e^(-I*arcsin(d*x + c))/d + 3/4*sqrt(b*arcsin(d*x + c) + a)*b*e^(-I
*arcsin(d*x + c))/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(3/2),x)
[Out] int((a + b*asin(c + d*x))^(3/2), x)
```

3.249 $\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\frac{\text{Int}\left(\frac{(a+b\arcsin(c+dx))^{3/2}}{c+dx},x\right)}{e}$$

```
[Out] Unintegrable((a+b*arcsin(d*x+c))^(3/2)/(d*x+c),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x),x]
[Out] Defer[Subst][Defer[Int][(a + b*ArcSin[x])^(3/2)/x, x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{3/2}}{ex}\,dx,x,c+dx\right)}{d}\\&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{3/2}}{x}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.55 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{3}{2}}}{dex+ce}dx$$

```
[In] int((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x)
[Out] int((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 3.31 (sec) , antiderivative size = 51, normalized size of antiderivative = 2.04

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\frac{\int \frac{a\sqrt{a+b\operatorname{asin}(c+dx)}}{c+dx}\,dx+\int \frac{b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**(3/2)/(d*e*x+c*e),x)
[Out] (Integral(a*sqrt(a + b*asin(c + d*x))/(c + d*x), x) + Integral(b*sqrt(a + b
*asin(c + d*x))*asin(c + d*x)/(c + d*x), x))/e
```

Maxima [N/A]

Not integrable

Time = 1.10 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(3/2)/(d*e*x + c*e), x)
```

Giac [N/A]

Not integrable

Time = 0.94 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(3/2)/(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^{3/2}}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(3/2)/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^(3/2)/(c*e + d*e*x), x)
```

3.250 $\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 475

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx &= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} \\ &- \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} \\ &- \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} \\ &+ \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} \\ &+ \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} \\ &- \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} \\ &+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d} \\ &- \frac{15b^{5/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d} \\ &- \frac{15b^{5/2}e^3\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{256d} \\ &+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{4096d}\end{aligned}$$

```
[Out] -3/32*e^3*(a+b*arcsin(d*x+c))^(5/2)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))
^(5/2)/d+15/8192*b^(5/2)*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*ar
```

```
csin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+15/8192*b^(5/2)*e^3*FresnelS
(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*P
i^(1/2)/d-15/256*b^(5/2)*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d-15/256*b^(5/2)*e^3*FresnelS(2*(a+b*arcsin(d*
x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+15/64*b*e^3*(d*x+c)*(a+
b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+5/32*b*e^3*(d*x+c)^3*(a+b*arcs
in(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+225/2048*b^2*e^3*(a+b*arcsin(d*x+c))
^(1/2)/d-45/256*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d-15/256*b^2*e^
3*(d*x+c)^4*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 475, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.480$, Rules used = {4889, 12, 4725, 4795, 4737, 4809, 3393, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{15\sqrt{\frac{\pi}{2}}b^{5/2}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d} - \frac{15\sqrt{\pi}b^{5/2}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d} - \frac{15\sqrt{\pi}b^{5/2}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d} + \frac{15\sqrt{\frac{\pi}{2}}b^{5/2}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{5be^3\sqrt{1-(c+dx)^2}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{15be^3\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d}$$

```
[In] Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (225*b^2*e^3*Sqrt[a + b*ArcSin[c + d*x]])/(2048*d) - (45*b^2*e^3*(c + d*x)^
2*Sqrt[a + b*ArcSin[c + d*x]])/(256*d) - (15*b^2*e^3*(c + d*x)^4*Sqrt[a + b
*ArcSin[c + d*x]])/(256*d) + (15*b*e^3*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a +
 b*ArcSin[c + d*x])^(3/2))/(64*d) + (5*b*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)
^2]*(a + b*ArcSin[c + d*x])^(3/2))/(32*d) - (3*e^3*(a + b*ArcSin[c + d*x])^
(5/2))/(32*d) + (e^3*(c + d*x)^4*(a + b*ArcSin[c + d*x])^(5/2))/(4*d) + (15
*b^(5/2)*e^3*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcS
in[c + d*x]])/Sqrt[b]])/(4096*d) - (15*b^(5/2)*e^3*Sqrt[Pi]*Cos[(2*a)/b]*Fr
esnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(256*d) - (15*b
^(5/2)*e^3*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[
Pi])]*Sin[(2*a)/b])/(256*d) + (15*b^(5/2)*e^3*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2
/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/(4096*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^3x^3(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int x^3(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} - \frac{(5be^3)\,\text{Subst}\left(\int \frac{x^4(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}\\
&= \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d}\\
&\quad + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d}\\
&\quad - \frac{(15be^3)\,\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{32d}\\
&\quad - \frac{(15b^2e^3)\,\text{Subst}\left(\int x^3\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{64d}\\
&= -\frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d}\\
&\quad + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d}\\
&\quad + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d}\\
&\quad + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d}\\
&\quad - \frac{(15be^3)\,\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{64d}\\
&\quad - \frac{(45b^2e^3)\,\text{Subst}\left(\int x\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{128d}\\
&\quad + \frac{(15b^3e^3)\,\text{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{512d}
\end{aligned}$$

$$= -\frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{(15b^2e^3)\,\text{Subst}\left(\int \frac{\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d} + \frac{(45b^3e^3)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{512d}$$

$$= -\frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{(15b^2e^3)\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}} + \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}} - \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{512d} + \frac{(45b^2e^3)\,\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d}$$

$$= \frac{45b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{(15b^2e^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4096d} - \frac{(15b^2e^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d} + \frac{(45b^2e^3)\operatorname{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} - \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{512d}$$

$$= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} - \frac{(45b^2e^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d} - \frac{\left(15b^2e^3\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d} + \frac{\left(15b^2e^3\cos\left(\frac{4a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4096d} - \frac{\left(15b^2e^3\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d} + \frac{\left(15b^2e^3\sin\left(\frac{4a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4096d}$$

$$= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d}$$
$$- \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d}$$
$$+ \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d}$$
$$+ \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d}$$
$$- \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d}$$
$$- \frac{\left(15b^2e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{512d}$$
$$- \frac{\left(45b^2e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d}$$
$$+ \frac{\left(15b^2e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2048d}$$
$$- \frac{\left(15b^2e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{512d}$$
$$- \frac{\left(45b^2e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{1024d}$$
$$+ \frac{\left(15b^2e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2048d}$$

$$= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d}$$
$$- \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d}$$
$$+ \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d}$$
$$+ \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d}$$
$$- \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d}$$
$$+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d}$$
$$- \frac{15b^{5/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{1024d}$$
$$- \frac{15b^{5/2}e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{1024d}$$
$$+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{4096d}$$
$$- \frac{\left(45b^2e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{512d}$$
$$- \frac{\left(45b^2e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{512d}$$

$$= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d} - \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d} - \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d} + \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d} - \frac{15b^{5/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d} - \frac{15b^{5/2}e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{256d} + \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{4096d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 255, normalized size of antiderivative = 0.54

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{ib^3e^3e^{-\frac{4ia}{b}}\left(16\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-16\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] ((I/2048)*b^3*e^3*(16*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c +
d*x]))/b]*Gamma[7/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 16*Sqrt[2]*E^(((
6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((2*I)*(a + b*Arc
Sin[c + d*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((-4*
I)*(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c +
d*x]))/b]*Gamma[7/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I)*a)/b
)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 885 vs. 2(391) = 782.

Time = 1.23 (sec) , antiderivative size = 886, normalized size of antiderivative = 1.87

method	result	size
default	Expression too large to display	886

```
[In] int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8192*e^3/d/(a+b*arcsin(d*x+c))^(1/2)*(-15*Pi^(1/2)*2^(1/2)*cos(4*a/b)*Fr
esnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*ar
csin(d*x+c))^(1/2)*(-1/b)^(1/2)*b^3+15*Pi^(1/2)*2^(1/2)*sin(4*a/b)*FresnelS
(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcsin(d
*x+c))^(1/2)*(-1/b)^(1/2)*b^3+480*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b)*b^3-480*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*
a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
b^3+1024*arcsin(d*x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-256*arcsin
(d*x+c)^3*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^3+3072*arcsin(d*x+c)^2*cos(
-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+1280*arcsin(d*x+c)^2*sin(-2*(a+b*arcs
in(d*x+c))/b+2*a/b)*b^3-768*arcsin(d*x+c)^2*cos(-4*(a+b*arcsin(d*x+c))/b+4*
a/b)*a*b^2-160*arcsin(d*x+c)^2*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^3+3072
*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-960*arcsin(d*x+c)*
cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+2560*arcsin(d*x+c)*sin(-2*(a+b*arcs
in(d*x+c))/b+2*a/b)*a*b^2-768*arcsin(d*x+c)*cos(-4*(a+b*arcsin(d*x+c))/b+4*
a/b)*a^2*b+60*arcsin(d*x+c)*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^3-320*arc
sin(d*x+c)*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a*b^2+1024*cos(-2*(a+b*arcsi
n(d*x+c))/b+2*a/b)*a^3-960*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+1280*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-256*cos(-4*(a+b*arcsin(d*x+c))/b+4
*a/b)*a^3+60*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a*b^2-160*sin(-4*(a+b*arcs
in(d*x+c))/b+4*a/b)*a^2*b)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = e^3\left(\int a^2c^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int a^2d^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2c^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abc^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 3a^2cd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 3a^2c^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2d^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abd^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 3b^2cd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 3b^2c^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 6abcd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 6abc^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] e**3*(Integral(a**2*c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d**3
*x**3*sqrt(a + b*asin(c + d*x)), x) + Integral(b**2*c**3*sqrt(a + b*asin(c
+ d*x))*asin(c + d*x)**2, x) + Integral(2*a*b*c**3*sqrt(a + b*asin(c + d*x)
)*asin(c + d*x), x) + Integral(3*a**2*c*d**2*x**2*sqrt(a + b*asin(c + d*x))
, x) + Integral(3*a**2*c**2*d*x*sqrt(a + b*asin(c + d*x)), x) + Integral(b*
*2*d**3*x**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integral(2*a*
b*d**3*x**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3*b**2*c
*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integral(3*b**2
*c**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integral(6*a*b*c
*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(6*a*b*c**
2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^{5/2} \, dx = \int (dex + ce)^3 (b \arcsin (dx + c) + a)^{\frac{5}{2}} \, dx$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^3*(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.85 (sec) , antiderivative size = 3408, normalized size of antiderivative = 7.17

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^{5/2} \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] -1/8192*(-512*I*sqrt(pi)*a^3*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*
a/b)/(sqrt(2)*b^(5/2) - I*sqrt(2)*b^(7/2)/abs(b)) - 128*sqrt(b*arcsin(d*x +
 c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(4*I*arcsin(d*x + c)) + 512*sqrt(b*arc
sin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(2*I*arcsin(d*x + c)) + 512*s
qrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c
)) - 128*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(-4*I*arcs
in(d*x + c)) - 1536*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4
*I*a/b)/(sqrt(2)*b^(3/2) + I*sqrt(2)*b^(5/2)/abs(b)) - 192*sqrt(pi)*a^2*b^2
*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(2)*b^(3/2) + I*sqrt(2)
*b^(5/2)/abs(b)) + 1024*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(
3/2) + I*b^(5/2)/abs(b)) - 1024*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(b*arcsin(d*x
 + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*
a/b)/(b^(3/2) - I*b^(5/2)/abs(b)) - 1024*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
*sqrt(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b))
- 384*sqrt(pi)*a^2*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/(sqrt
(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b)) + 1536*I*sqrt(pi)*a^3*sqrt(b)*e^3*e
rf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(2)*b + I*sqrt(2)*b^2/abs(b))
 - 192*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sq
```

rt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(
sqrt(2)*b + I*sqrt(2)*b^2/abs(b)) - 1024*I*sqrt(pi)*a^3*sqrt(b)*e^3*erf(-sq
rt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/a
bs(b))*e^(2*I*a/b)/(b + I*b^2/abs(b)) + 1536*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-
sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)
/abs(b))*e^(2*I*a/b)/(b + I*b^2/abs(b)) + 1024*I*sqrt(pi)*a^3*sqrt(b)*e^3*e
rf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqr
t(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^2/abs(b)) + 1536*sqrt(pi)*a^2*b^(3/2)*e^
3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*
sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^2/abs(b)) + 1024*I*sqrt(pi)*a^3*sqrt(
b)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*b - I*sqrt(2)*b^
2/abs(b)) - 256*sqrt(b*arcsin(d*x + c) + a)*a*b*e^3*arcsin(d*x + c)*e^(4*I*
arcsin(d*x + c)) - 80*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)
*e^(4*I*arcsin(d*x + c)) + 1024*sqrt(b*arcsin(d*x + c) + a)*a*b*e^3*arcsin(
d*x + c)*e^(2*I*arcsin(d*x + c)) + 640*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^
3*arcsin(d*x + c)*e^(2*I*arcsin(d*x + c)) + 1024*sqrt(b*arcsin(d*x + c) + a
)*a*b*e^3*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c)) - 640*I*sqrt(b*arcsin(d*
x + c) + a)*b^2*e^3*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c)) - 256*sqrt(b*a
rcsin(d*x + c) + a)*a*b*e^3*arcsin(d*x + c)*e^(-4*I*arcsin(d*x + c)) + 80*I
*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)*e^(-4*I*arcsin(d*x + c
)) - 512*I*sqrt(pi)*a^3*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b
) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt
(2)*sqrt(b) + I*sqrt(2)*b^(3/2)/abs(b)) + 384*sqrt(pi)*a^2*b*e^3*erf(-sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(2)*sqrt(b) + I*sqrt(2)*b^(3/2)/abs(b)
) - 72*I*sqrt(pi)*a*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b
) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt
(2)*sqrt(b) + I*sqrt(2)*b^(3/2)/abs(b)) + 15*sqrt(pi)*b^3*e^3*erf(-sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(2)*sqrt(b) + I*sqrt(2)*b^(3/2)/abs(b)) -
 1536*sqrt(pi)*a^2*b*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(
b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b) + I*b^(3/2)/abs
(b)) + 576*I*sqrt(pi)*a*b^2*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b) + I*b^(3
/2)/abs(b)) - 1024*I*sqrt(pi)*a^3*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b) -
 I*b^(3/2)/abs(b)) - 1536*sqrt(pi)*a^2*b*e^3*erf(-sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sq
rt(b) - I*b^(3/2)/abs(b)) - 576*I*sqrt(pi)*a*b^2*e^3*erf(-sqrt(b*arcsin(d*x
 + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*
a/b)/(sqrt(b) - I*b^(3/2)/abs(b)) + 512*I*sqrt(pi)*a^3*e^3*erf(-sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sq
rt(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*sqrt(b) - I*sqrt(2)*b^(3/2)/abs(b)) + 3
84*sqrt(pi)*a^2*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*

```
sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*s
qrt(b) - I*sqrt(2)*b^(3/2)/abs(b)) + 15*sqrt(pi)*b^3*e^3*erf(-sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*sqrt(b) - I*sqrt(2)*b^(3/2)/abs(b)) + 512
*I*sqrt(pi)*a^3*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(b)*(sqr
t(2) + I*sqrt(2)*b/abs(b))) + 72*I*sqrt(pi)*a*b^(3/2)*e^3*erf(-sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqr
t(b)/abs(b))*e^(4*I*a/b)/(sqrt(2) + I*sqrt(2)*b/abs(b)) - 576*I*sqrt(pi)*a*
b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b/abs(b) + 1) - 240*sqrt(pi)*b^(5/
2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b/abs(b) + 1) + 1024*I*sqrt(pi)*a^3*e^3
*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*s
qrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b)*(-I*b/abs(b) + 1)) + 576*I*sqrt(pi)*a*
b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) + 1) - 240*sqrt(pi)*b^(
5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c
) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) + 1) - 128*sqrt(b*arcsin(d
*x + c) + a)*a^2*e^3*e^(4*I*arcsin(d*x + c)) - 80*I*sqrt(b*arcsin(d*x + c)
+ a)*a*b*e^3*e^(4*I*arcsin(d*x + c)) + 30*sqrt(b*arcsin(d*x + c) + a)*b^2*e
^3*e^(4*I*arcsin(d*x + c)) + 512*sqrt(b*arcsin(d*x + c) + a)*a^2*e^3*e^(2*I
*arcsin(d*x + c)) + 640*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^3*e^(2*I*arcsin
(d*x + c)) - 480*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*e^(2*I*arcsin(d*x + c)
) + 512*sqrt(b*arcsin(d*x + c) + a)*a^2*e^3*e^(-2*I*arcsin(d*x + c)) - 640*
I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^3*e^(-2*I*arcsin(d*x + c)) - 480*sqrt(b
*arcsin(d*x + c) + a)*b^2*e^3*e^(-2*I*arcsin(d*x + c)) - 128*sqrt(b*arcsin(
d*x + c) + a)*a^2*e^3*e^(-4*I*arcsin(d*x + c)) + 80*I*sqrt(b*arcsin(d*x + c
) + a)*a*b*e^3*e^(-4*I*arcsin(d*x + c)) + 30*sqrt(b*arcsin(d*x + c) + a)*b^
2*e^3*e^(-4*I*arcsin(d*x + c)))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx=\int (c\,e+d\,e\,x)^3\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^{5/2}\,dx$$

```
[In] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(5/2), x)
```

3.251 $\int (ce+dex)^2(a+b\arcsin (c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 427

$$\begin{aligned}\int (ce+dex)^2(a+b\arcsin (c+dx))^{5/2}\,dx= & -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin (c+dx)}}{6d}-\frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin (c+dx)}}{36d}\\ & +\frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))^{3/2}}{9d}\\ & +\frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))^{3/2}}{18d}\\ & +\frac{e^2(c+dx)^3(a+b\arcsin (c+dx))^{5/2}}{3d}\\ & +\frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}}\right)}{16d}\\ & -\frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}}\right)}{144d}\\ & -\frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{16d}\\ & +\frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{144d}\end{aligned}$$

```
[Out] 1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(5/2)/d-5/864*b^(5/2)*e^2*cos(3*a/b)*
FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/
2)/d+5/864*b^(5/2)*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
```

```
b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d+15/32*b^(5/2)*e^2*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-15/3
2*b^(5/2)*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*
sin(a/b)*2^(1/2)*Pi^(1/2)/d+5/9*b*e^2*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^
2)^(1/2)/d+5/18*b*e^2*(d*x+c)^2*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/
2)/d-5/6*b^2*e^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d-5/36*b^2*e^2*(d*x+c)^3
*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 427, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.520$, Rules used = {4889, 12, 4725, 4795, 4767, 4715, 4809, 3387, 3386, 3432, 3385, 3433, 3393}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15\sqrt{\frac{\pi}{2}}b^{5/2}e^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{16d} + \frac{5\sqrt{\frac{\pi}{6}}b^{5/2}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{144d} + \frac{15\sqrt{\frac{\pi}{2}}b^{5/2}e^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{16d} - \frac{5\sqrt{\frac{\pi}{6}}b^{5/2}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{144d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} - \frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} + \frac{5be^2\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d}$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-5*b^2*e^2*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/(6*d) - (5*b^2*e^2*(c +
d*x)^3*Sqrt[a + b*ArcSin[c + d*x]])/(36*d) + (5*b*e^2*Sqrt[1 - (c + d*x)^2]
*(a + b*ArcSin[c + d*x])^(3/2))/(9*d) + (5*b*e^2*(c + d*x)^2*Sqrt[1 - (c +
d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2))/(18*d) + (e^2*(c + d*x)^3*(a + b*Arc
Sin[c + d*x])^(5/2))/(3*d) + (15*b^(5/2)*e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(
```

```
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(16*d) - (5*b^(5/2)*e^2*S
qrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sq
rt[b]])/(144*d) - (15*b^(5/2)*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(16*d) + (5*b^(5/2)*e^2*Sqrt[Pi/6]*F
resnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(14
4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} - \frac{(5be^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{6d}\\
&= \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d}\\
&\quad + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d}\\
&\quad - \frac{(5be^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{9d}\\
&\quad - \frac{(5b^2e^2)\,\text{Subst}\left(\int x^2\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{12d}\\
&= -\frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d}\\
&\quad + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d}\\
&\quad + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d}\\
&\quad + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d}\\
&\quad - \frac{(5b^2e^2)\,\text{Subst}\left(\int \sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{6d}\\
&\quad + \frac{(5b^3e^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{72d}
\end{aligned}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d} + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} - \frac{(5b^2e^2)\,\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{72d} + \frac{(5b^3e^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{12d}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d} + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} - \frac{(5b^2e^2)\,\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}} + \frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{72d} - \frac{(5b^2e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{12d}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d} + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} + \frac{(5b^2e^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{288d} - \frac{(5b^2e^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{96d} + \frac{\left(5b^2e^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{12d} - \frac{\left(5b^2e^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{12d}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d} + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} + \frac{\left(5b^2e^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{96d} + \frac{\left(5b^2e^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{6d} - \frac{\left(5b^2e^2\cos\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{288d} - \frac{\left(5b^2e^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{96d} - \frac{\left(5b^2e^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{6d} + \frac{\left(5b^2e^2\sin\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{288d}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d}$$
$$+ \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d}$$
$$+ \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d}$$
$$+ \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d}$$
$$+ \frac{5b^{5/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{6d}$$
$$- \frac{5b^{5/2}e^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{6d}$$
$$+ \frac{\left(5b^2e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{48d}$$
$$- \frac{\left(5b^2e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{144d}$$
$$- \frac{\left(5b^2e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{48d}$$
$$+ \frac{\left(5b^2e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{144d}$$

$$= -\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d} - \frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d} + \frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d} + \frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d} + \frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{16d} - \frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{144d} - \frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{16d} + \frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{144d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.31 (sec) , antiderivative size = 249, normalized size of antiderivative = 0.58

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{b^3e^2e^{-\frac{3ia}{b}}\left(-81e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-81e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (b^3*e^2*(-81*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[
7/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 81*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*
ArcSin[c + d*x]))/b]*Gamma[7/2, (I*(a + b*ArcSin[c + d*x]))/b] + Sqrt[3]*(S
qrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((-3*I)*(a + b*ArcSin[c +
d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2,
((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(648*d*E^(((3*I)*a)/b)*Sqrt[a + b*Arc
Sin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 878 vs. 2(347) = 694.

Time = 1.24 (sec) , antiderivative size = 879, normalized size of antiderivative = 2.06

method	result	size
default	Expression too large to display	879

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/864*e^2/d*(405*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*Fresn
elS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)
*b^3+405*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/
2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3-5*Pi
^(1/2)*2^(1/2)*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcsin(d*x+c))^(1/2)*b^3-5*Pi^(1/2)*
2^(1/2)*(-3/b)^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcsin(d*x+c))^(1/2)*b^3+216*arcsin(d*x+c)^
3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-72*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b
)*arcsin(d*x+c)^3*b^3+648*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a
*b^2-540*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-216*sin(-3*(a+
b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*a*b^2+60*cos(-3*(a+b*arcsin(d*x+c
))/b+3*a/b)*arcsin(d*x+c)^2*b^3+648*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/
b+a/b)*a^2*b-810*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-1080*arc
sin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^2-216*sin(-3*(a+b*arcsin(d*x
+c))/b+3*a/b)*arcsin(d*x+c)*a^2*b+30*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*ar
csin(d*x+c)*b^3+120*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)*a*b^2
+216*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-810*sin(-(a+b*arcsin(d*x+c))/b+a/b
)*a*b^2-540*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-72*sin(-3*(a+b*arcsin(d*x
+c))/b+3*a/b)*a^3+30*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a*b^2+60*cos(-3*(a
+b*arcsin(d*x+c))/b+3*a/b)*a^2*b)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = e^2\left(\int a^2c^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int a^2d^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2c^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abc^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2a^2cdx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2d^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2b^2cdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 4abcdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] e**2*(Integral(a**2*c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d**2
*x**2*sqrt(a + b*asin(c + d*x)), x) + Integral(b**2*c**2*sqrt(a + b*asin(c
+ d*x))*asin(c + d*x)**2, x) + Integral(2*a*b*c**2*sqrt(a + b*asin(c + d*x)
)*asin(c + d*x), x) + Integral(2*a**2*c*d*x*sqrt(a + b*asin(c + d*x)), x) +
 Integral(b**2*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + I
ntegral(2*a*b*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integ
ral(2*b**2*c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integral(
4*a*b*c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.21 (sec) , antiderivative size = 2826, normalized size of antiderivative = 6.62

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^{5/2} \, dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] 1/576*(72*sqrt(2)*sqrt(pi)*a^3*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(
b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 72*sqrt(2)*sqrt(
pi)*a^3*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^
3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 216*I*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf
(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*s
qrt(abs(b))) - 216*I*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 24*I*s
qrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c)
) - 72*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)^2*e^(I*arcsin(
d*x + c)) + 72*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)^2*e^(-
I*arcsin(d*x + c)) - 24*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x +
c)^2*e^(-3*I*arcsin(d*x + c)) - 144*sqrt(pi)*a^3*sqrt(b)*e^2*erf(-1/2*sqrt(
6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 14
4*I*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/s
qrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a
/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 216*I*sqrt(2)*sqrt(pi)*a^2*b*e^2*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqr
t(abs(b))) - 135*I*sqrt(2)*sqrt(pi)*b^3*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 216*I*sqrt(2)*sqr
t(pi)*a^2*b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/
sqrt(abs(b)) + sqrt(abs(b))) + 135*I*sqrt(2)*sqrt(pi)*b^3*e^2*erf(1/2*I*sqr
t(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b)))
- 144*sqrt(pi)*a^3*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*
I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 144*I*sqrt(pi)*a^2*b^(3/2)*e^2*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b
```

*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b ^2/abs(b)) + 48*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^2*arcsin(d*x + c)*e^(3* I*arcsin(d*x + c)) - 20*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c) *e^(3*I*arcsin(d*x + c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^2*arcsin (d*x + c)*e^(I*arcsin(d*x + c)) + 180*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*a rcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a* b*e^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 180*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) - 48*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e^2*arcsin(d*x + c)*e^(-3*I*arcsin(d*x + c)) - 20*sqrt(b*arc sin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)*e^(-3*I*arcsin(d*x + c)) + 144*sq rt(pi)*a^3*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I *sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*s qrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 144*I*sqrt(pi)*a^2*b*e^2*erf(-1/2*sqrt (6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/a bs(b)) + 36*sqrt(pi)*a*b^2*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a) /sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I *a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) - 144*sqrt(pi)*a^3*e^2*e rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq rt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 144*sqrt(pi)*a^3*e^2*erf(1/2*I*sqrt(2)*sqrt(b* arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a) *sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) + 144*sqrt(pi)*a^3*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqr t(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/ b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) - 144*I*sqrt(pi)*a^2*b*e^2* erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b *arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqr t(6)*b^(3/2)/abs(b)) + 36*sqrt(pi)*a*b^2*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin (d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/ abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) - 36*sqrt (pi)*a*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1 /2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) + 10*I*sqrt(pi)*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)* sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) - 36*sqrt(pi)*a* b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sq rt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6) - I *sqrt(6)*b/abs(b)) - 10*I*sqrt(pi)*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcs in(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6) - I*sqrt(6)*b/abs(b)) + 24*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^2*e^(3*I*arcsin(d*x + c)) - 20*sqrt(b*arcsin(d*x + c) + a)*a*b*e^2*e^(3*I*arcsin(d*x + c)) - 10*I*sqrt(b*arcsin(d*x + c) + a)*b^2* e^2*e^(3*I*arcsin(d*x + c)) - 72*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^2*e^(I *arcsin(d*x + c)) + 180*sqrt(b*arcsin(d*x + c) + a)*a*b*e^2*e^(I*arcsin(d*x

```
 + c)) + 270*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*e^(I*arcsin(d*x + c)) +
72*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^2*e^(-I*arcsin(d*x + c)) + 180*sqrt(
b*arcsin(d*x + c) + a)*a*b*e^2*e^(-I*arcsin(d*x + c)) - 270*I*sqrt(b*arcsin
(d*x + c) + a)*b^2*e^2*e^(-I*arcsin(d*x + c)) - 24*I*sqrt(b*arcsin(d*x + c)
 + a)*a^2*e^2*e^(-3*I*arcsin(d*x + c)) - 20*sqrt(b*arcsin(d*x + c) + a)*a*b
*e^2*e^(-3*I*arcsin(d*x + c)) + 10*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*e^
(-3*I*arcsin(d*x + c)))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(5/2), x)
```

3.252 $\int (ce+dex)(a+b\arcsin (c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 256

$$\int (ce+dex)(a+b\arcsin (c+dx))^{5/2}\,dx = \frac{15b^2e\sqrt{a+b\arcsin (c+dx)}}{64d} - \frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin (c+dx)}}{32d} + \frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))^{3/2}}{8d} - \frac{e(a+b\arcsin (c+dx))^{5/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin (c+dx))^{5/2}}{2d} - \frac{15b^{5/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d} - \frac{15b^{5/2}e\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin (c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d}$$

```
[Out] -1/4*e*(a+b*arcsin(d*x+c))^(5/2)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(5/2
)/d-15/128*b^(5/2)*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2
)/Pi^(1/2))*Pi^(1/2)/d-15/128*b^(5/2)*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+5/8*b*e*(d*x+c)*(a+b*arcsin(d*x+c
))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+15/64*b^2*e*(a+b*arcsin(d*x+c))^(1/2)/d-15/3
2*b^2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4889, 12, 4725, 4795, 4737, 4809, 3393, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15\sqrt{\pi}b^{5/2}e\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d} - \frac{15\sqrt{\pi}b^{5/2}e\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d} - \frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d} - \frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (15*b^2*e*Sqrt[a + b*ArcSin[c + d*x]])/(64*d) - (15*b^2*e*(c + d*x)^2*Sqrt[
a + b*ArcSin[c + d*x]])/(32*d) + (5*b*e*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a
+ b*ArcSin[c + d*x])^(3/2))/(8*d) - (e*(a + b*ArcSin[c + d*x])^(5/2))/(4*d)
 + (e*(c + d*x)^2*(a + b*ArcSin[c + d*x])^(5/2))/(2*d) - (15*b^(5/2)*e*Sqrt
[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi
])])/(128*d) - (15*b^(5/2)*e*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x
]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(128*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^{5/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}-\frac{(5be)\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}-\frac{(5be)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}\\
&\quad-\frac{(15b^2e)\,\text{Subst}\left(\int x\sqrt{a+b\arcsin(x)}\,dx,x,c+dx\right)}{16d}\\
&= -\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d}\\
&\quad+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}\\
&\quad-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}\\
&\quad+\frac{(15b^3e)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{64d}
\end{aligned}$$

$$=-\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(15b^2e)\operatorname{Subst}\left(\int\frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{64d}$$

$$=-\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(15b^2e)\operatorname{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{64d}$$

$$=\frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d}-\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}-\frac{(15b^2e)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{128d}$$

$$=\frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d}-\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d}-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d}-\frac{\left(15b^2e\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{128d}-\frac{\left(15b^2e\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{128d}$$

$$= \frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d} - \frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d} - \frac{\left(15b^2e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{64d} - \frac{\left(15b^2e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{64d}$$

$$= \frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d} - \frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d} + \frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{5/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d} - \frac{15b^{5/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d} - \frac{15b^{5/2}e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.55

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{ib^3ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right) - e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},\frac{2i(a+b\arcsin}{b}\right.\right.}{32\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] ((I/32)*b^3*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((-2*I)*(a
 + b*ArcSin[c + d*x]))/b] - E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x])
)/b]*Gamma[7/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)*a
)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 448 vs. $2(210) = 420$.

Time = 0.85 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.75

method	result
default	$-\frac{e\left(15\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b^3-15\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\mathrm{Fres}}{}$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/128*e/d/(a+b*arcsin(d*x+c))^(1/2)*(15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)*b^3-15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*
sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b)*b^3+32*arcsin(d*x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+96*arc
sin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+40*arcsin(d*x+c)^2*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+96*arcsin(d*x+c)*cos(-2*(a+b*arcsin(
d*x+c))/b+2*a/b)*a^2*b-30*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)
*b^3+80*arcsin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+32*cos(-2*(
a+b*arcsin(d*x+c))/b+2*a/b)*a^3-30*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^
2+40*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = e\left(\int a^2c\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int a^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2c\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abc\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int b^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(5/2),x)
[Out] e*(Integral(a**2*c*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d*x*sqrt(a
 + b*asin(c + d*x)), x) + Integral(b**2*c*sqrt(a + b*asin(c + d*x))*asin(c
+ d*x)**2, x) + Integral(2*a*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x
) + Integral(b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Inte
gral(2*a*b*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \int (dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.13 (sec) , antiderivative size = 1449, normalized size of antiderivative = 5.66

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] 1/4*I*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*s
qrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b)
```

)*d) - 3/8*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d) - 1/4*I*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d) - 3/8*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^2 - I*b^3/abs(b))*d) - 1/8*sqrt(b*arcsin(d*x + c) + a)*b^2*e*arcsin(d*x + c)^2*e^(2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c) + a)*b^2*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c))/d + 3/8*sqrt(pi)*a^2*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d) - 9/64*I*sqrt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d) + 1/4*I*sqrt(pi)*a^3*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) + 3/8*sqrt(pi)*a^2*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) + 9/64*I*sqrt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) - 1/4*I*sqrt(pi)*a^3*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) + 9/64*I*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) + 15/256*sqrt(pi)*b^(7/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) - 9/64*I*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b))*d) + 15/256*sqrt(pi)*b^(7/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/abs(b))*d) - 1/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e*arcsin(d*x + c)*e^(2*I*arcsin(d*x + c))/d - 5/32*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e*arcsin(d*x + c)*e^(2*I*arcsin(d*x + c))/d - 1/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c))/d + 5/32*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c) + a)*a^2*e*e^(2*I*arcsin(d*x + c))/d - 5/32*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e*e^(2*I*arcsin(d*x + c))/d + 15/128*sqrt(b*arcsin(d*x + c) + a)*b^2*e*e^(2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c) + a)*a^2*e*e^(-2*I*arcsin(d*x + c))/d + 5/32*I*sqrt(b*arcsin(d*x + c) + a)*a*b*e*e^(-2*I*arcsin(d*x + c))/d + 15/128*sqrt(b*arcsin(d*x + c) + a)*b^2*e*e^(-2*I*arcsin(d*x + c))/d

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx=\int (c\,e+d\,e\,x)\ \left(a+b\,\mathrm{asin}(c+d\,x)\right)^{5/2}\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2), x)
```

3.253 $\int (a+b\arcsin(c+dx))^{5/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 204

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}$$

```
[Out] (d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d+15/8*b^(5/2)*cos(a/b)*FresnelS(2^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-15/8*b^(5/2)
*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1
/2)*Pi^(1/2)/d+5/2*b*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d-15/4*b
^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used

$= \{4887, 4715, 4767, 4809, 3387, 3386, 3432, 3385, 3433\}$

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15\sqrt{\frac{\pi}{2}}b^{5/2}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{15\sqrt{\frac{\pi}{2}}b^{5/2}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-15*b^2*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]])/(4*d) + (5*b*Sqrt[1 - (c +
d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2))/(2*d) + ((c + d*x)*(a + b*ArcSin[c +
 d*x])^(5/2))/d + (15*b^(5/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*d) - (15*b^(5/2)*Sqrt[Pi/2]*FresnelC[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(4*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{5/2}\,dx, x, c+dx\right)}{d}\\
&= \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} - \frac{(5b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{3/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d}\\
&= \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d}\\
&\quad - \frac{(15b^2)\,\text{Subst}\left(\int \sqrt{a+b\arcsin(x)}\,dx, x, c+dx\right)}{4d}
\end{aligned}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{(15b^3)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} - \frac{(15b^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{\left(15b^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d} - \frac{\left(15b^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{\left(15b^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d} - \frac{\left(15b^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4d}$$

$$= -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.35 (sec) , antiderivative size = 419, normalized size of antiderivative = 2.05

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \frac{\sqrt{b}e^{-\frac{ia}{b}}\left(i(4a^2+15b^2)\left(-1+e^{\frac{2ia}{b}}\right)\sqrt{2\pi}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[b]*(I*(4*a^2 + 15*b^2)*(-1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*A
rcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]
+ (4*a^2 + 15*b^2)*(1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c + d
*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 4*Sqrt[b]
*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(-15*b*(c + d*x) + 10*a*Sqrt[1 - c^2
- 2*c*d*x - d^2*x^2] + 2*(4*a*(c + d*x) + 5*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*
x^2])*ArcSin[c + d*x] + 4*b*(c + d*x)*ArcSin[c + d*x]^2) + 2*a^2*Sqrt[((-I)
*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] +
 2*a^2*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (I*(a
 + b*ArcSin[c + d*x]))/b])))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 440 vs. $2(164) = 328$.

Time = 0.33 (sec) , antiderivative size = 441, normalized size of antiderivative = 2.16

method	result
default	$-\frac{15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b^3+15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d*(15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+15
*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+8*arcsin(d*x
+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3+24*arcsin(d*x+c)^2*sin(-(a+b*arcs
in(d*x+c))/b+a/b)*a*b^2-20*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*
b^3+24*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-30*arcsin(d*x+c)
*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-40*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+
```

```
c))/b+a/b)*a*b^2+8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-30*sin(-(a+b*arcsin(
d*x+c))/b+a/b)*a*b^2-20*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b)/(a+b*arcsin(
d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \int (a+b\,\mathrm{asin}\,(c+dx))^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(5/2), x)
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.26 (sec) , antiderivative size = 1279, normalized size of antiderivative = 6.27

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

[Out] 1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c))/d - sqrt(pi)*a^3*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - sqrt(pi)*a^3*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d) - I*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/d + I*sqrt(b*arcsin(d*x + c) + a)*a*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*b^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/d - 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e^(I*arcsin(d*x + c))/d + 15/8*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(-I*arcsin(d*x + c))/d + 5/4*sqrt(b*arcsin(d*x + c) + a)*a*b*e^(-I*arcsin(d*x + c))/d - 15/8*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^(-I*arcsin(d*x + c))/d

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(5/2),x)
[Out] int((a + b*asin(c + d*x))^(5/2), x)
```

3.254 $\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\frac{\text{Int}\left(\frac{(a+b\arcsin(c+dx))^{5/2}}{c+dx},x\right)}{e}$$

```
[Out] Unintegrable((a+b*arcsin(d*x+c))^(5/2)/(d*x+c),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x),x]
[Out] Defer[Subst][Defer[Int][(a + b*ArcSin[x])^(5/2)/x, x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{5/2}}{ex}\,dx,x,c+dx\right)}{d}\\&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{5/2}}{x}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.66 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{5}{2}}}{dex+ce}dx$$

```
[In] int((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x)
[Out] int((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 24.40 (sec) , antiderivative size = 88, normalized size of antiderivative = 3.52

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\frac{\int \frac{a^2\sqrt{a+b\operatorname{asin}(c+dx)}}{c+dx}\,dx+\int \frac{b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}{c+dx}\,dx+\int \frac{2ab\sqrt{a+b\operatorname{asin}(c+dx)}\,a}{c+dx}}{e}$$

```
[In] integrate((a+b*asin(d*x+c))**(5/2)/(d*e*x+c*e),x)
[Out] (Integral(a**2*sqrt(a + b*asin(c + d*x))/(c + d*x), x) + Integral(b**2*sqrt
(a + b*asin(c + d*x))*asin(c + d*x)**2/(c + d*x), x) + Integral(2*a*b*sqrt(
a + b*asin(c + d*x))*asin(c + d*x)/(c + d*x), x))/e
```

Maxima [N/A]

Not integrable

Time = 1.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(5/2)/(d*e*x + c*e), x)
```

Giac [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(5/2)/(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^{5/2}}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(5/2)/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^(5/2)/(c*e + d*e*x), x)
```

3.255 $\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 518

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{864d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{864d}$$

```
[Out] -35/18*b^2*e^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-35/108*b^2*e^2*(d*x+c)^3
*(a+b*arcsin(d*x+c))^(3/2)/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(7/2)/d-
35/5184*b^(7/2)*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/d-35/5184*b^(7/2)*e^2*FresnelS(6^(1/2)/Pi
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d+105
/64*b^(7/2)*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/64*b^(7/2)*e^2*FresnelS(2^(1/2)/Pi^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/9*b*e^2*(a
+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d+7/18*b*e^2*(d*x+c)^2*(a+b*arc
sin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-175/54*b^3*e^2*(1-(d*x+c)^2)^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/d-35/216*b^3*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 1.07 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.560$, Rules used = {4889, 12, 4725, 4795, 4767, 4715, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \frac{105\sqrt{\frac{\pi}{2}}b^{7/2}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{32d} - \frac{35\sqrt{\frac{\pi}{6}}b^{7/2}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{864d} + \frac{105\sqrt{\frac{\pi}{2}}b^{7/2}e^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{32d} - \frac{35\sqrt{\frac{\pi}{6}}b^{7/2}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{864d} - \frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d}$$

```
[In] Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-175*b^3*e^2*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(54*d) - (
35*b^3*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(
216*d) - (35*b^2*e^2*(c + d*x)*(a + b*ArcSin[c + d*x])^(3/2))/(18*d) - (35*
b^2*e^2*(c + d*x)^3*(a + b*ArcSin[c + d*x])^(3/2))/(108*d) + (7*b*e^2*Sqrt[
1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(5/2))/(9*d) + (7*b*e^2*(c + d*x)^
2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(5/2))/(18*d) + (e^2*(c + d
*x)^3*(a + b*ArcSin[c + d*x])^(7/2))/(3*d) + (105*b^(7/2)*e^2*Sqrt[Pi/2]*Co
```

```
s[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(32*d) -
 (35*b^(7/2)*e^2*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c + d*x]])/Sqrt[b]])/(864*d) + (105*b^(7/2)*e^2*Sqrt[Pi/2]*FresnelS[(S
qrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(32*d) - (35*b^(7
/2)*e^2*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b
]]*Sin[(3*a)/b])/(864*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^2x^2(a+b\arcsin(x))^{7/2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^2\text{Subst}\left(\int x^2(a+b\arcsin(x))^{7/2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} - \frac{(7be^2)\,\text{Subst}\left(\int \frac{x^3(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{6d}$$

$$= \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} - \frac{(7be^2)\,\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9d} - \frac{(35b^2e^2)\,\text{Subst}\left(\int x^2(a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{36d}$$

$$= -\frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} - \frac{(35b^2e^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{18d} + \frac{(35b^3e^2)\,\text{Subst}\left(\int \frac{x^3\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{72d}$$

$$= -\frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{(35b^3e^2)\,\text{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{108d} + \frac{(35b^3e^2)\,\text{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{12d} + \frac{(35b^4e^2)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{432d}$$

$$= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{(35b^3e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{432d} + \frac{(35b^4e^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{216d} + \frac{(35b^4e^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{24d}$$

$$
\begin{aligned}
&= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} \\
&\quad - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} \\
&\quad - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} \\
&\quad - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} \\
&\quad + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} \\
&\quad + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} \\
&\quad + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} \\
&\quad + \frac{(35b^3e^2)\,\mathrm{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{432d} \\
&\quad + \frac{(35b^3e^2)\,\mathrm{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{216d} \\
&\quad + \frac{(35b^3e^2)\,\mathrm{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{24d}
\end{aligned}
$$

$$= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} - \frac{(35b^3e^2)\,\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d} + \frac{(35b^3e^2)\,\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d} + \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{216d} + \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{24d} + \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{216d} + \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{24d}$$

$$
\begin{aligned}
&= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} \\
&- \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} \\
&- \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} \\
&- \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} \\
&+ \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} \\
&+ \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} \\
&+ \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} \\
&+ \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d} \\
&+ \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{108d} \\
&+ \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{12d} \\
&- \frac{\left(35b^3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d} \\
&+ \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d} \\
&+ \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{108d} \\
&+ \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{12d} \\
&- \frac{\left(35b^3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{1728d}
\end{aligned}
$$

$$= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{175b^{7/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{54d} + \frac{175b^{7/2}e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{54d} + \frac{\left(35b^3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{864d} - \frac{\left(35b^3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{864d} + \frac{\left(35b^3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{864d} - \frac{\left(35b^3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{864d}$$

$$= -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{864d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{864d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.52

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \frac{be^2e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^{5/2}\left(-243e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-243e\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (b*e^2*(a + b*ArcSin[c + d*x])^(5/2)*(-243*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*A
rcSin[c + d*x]))/b]*Gamma[9/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 243*E^((
(4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[9/2, (I*(a + b*Arc
```

```
Sin[c + d*x]))/b] + Sqrt[3]*(Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[9/2,
 ((-3*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*Ar
cSin[c + d*x]))/b]*Gamma[9/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(1944*d
*E^(((3*I)*a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1233 vs. $2(426) = 852$.

Time = 1.32 (sec) , antiderivative size = 1234, normalized size of antiderivative = 2.38

method	result	size
default	Expression too large to display	1234

```
[In] int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5184*e^2/d*(5184*arcsin(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+7
776*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-13608*arcsin(d*
x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+5184*arcsin(d*x+c)*sin(-(a+b*a
rcsin(d*x+c))/b+a/b)*a^3*b-22680*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a
/b)*a*b^3-13608*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+504*c
os(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^3*b^4+420*sin(-3*(a+b*arcs
in(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*b^4-210*cos(-3*(a+b*arcsin(d*x+c))/b+3*
a/b)*arcsin(d*x+c)*b^4+420*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^2*b^2+504*
cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^3*b-210*cos(-3*(a+b*arcsin(d*x+c))/b+
3*a/b)*a*b^3-432*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^4*b^4+12
96*arcsin(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-4536*arcsin(d*x+c)^3
*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-11340*arcsin(d*x+c)^2*sin(-(a+b*arcsin
(d*x+c))/b+a/b)*b^4+17010*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^4
-11340*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-4536*cos(-(a+b*arcsin(d*x+c)
)/b+a/b)*a^3*b+17010*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-8505*(a+b*arcsin
(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+8505*(a+b*arcsin(d*x+c))
^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4-432*sin(-3*(a+b*arcsin(d*x+c))/b
+3*a/b)*a^4+35*(a+b*arcsin(d*x+c))^(1/2)*(-3/b)^(1/2)*2^(1/2)*cos(3*a/b)*Fr
esnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*Pi^(1/2
)*b^4-35*(a+b*arcsin(d*x+c))^(1/2)*(-3/b)^(1/2)*2^(1/2)*sin(3*a/b)*FresnelS
(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*Pi^(1/2)*b^4+
1296*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^4+1512*cos(-3*(a+b*arcsin(d*x+c))/b+
3*a/b)*arcsin(d*x+c)^2*a*b^3+840*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin
(d*x+c)*a*b^3+1512*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)*a^2*b^
2-1728*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^3*a*b^3-2592*sin(-
3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*a^2*b^2-1728*sin(-3*(a+b*arc
sin(d*x+c))/b+3*a/b)*arcsin(d*x+c)*a^3*b)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 3.01 (sec) , antiderivative size = 8028, normalized size of antiderivative = 15.50

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] 1/3456*(1296*sqrt(2)*sqrt(pi)*a^4*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(a
bs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 1296*sqrt(2)*
```

sqrt(pi)*a^4*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 864*sqrt(2)*sqrt(pi)*a^4*b*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 2808*I*sqrt(2)*sqrt(pi)*a^3*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 864*sqrt(2)*sqrt(pi)*a^4*b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 2808*I*sqrt(2)*sqrt(pi)*a^3*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c)) - 1296*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) + 1296*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(-3*I*arcsin(d*x + c)) - 864*sqrt(pi)*a^4*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 1872*I*sqrt(pi)*a^3*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 2592*I*sqrt(2)*sqrt(pi)*a^3*b*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 972*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 2430*I*sqrt(2)*sqrt(pi)*a*b^3*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 2592*I*sqrt(2)*sqrt(pi)*a^3*b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) - 972*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 2430*I*sqrt(2)*sqrt(pi)*a*b^3*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) - 864*sqrt(pi)*a^4*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 1872*I*sqrt(pi)*a^3*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*arcsin(d*x + c)*e^

(3*I*arcsin(d*x + c)) - 360*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*
x + c)*e^(3*I*arcsin(d*x + c)) - 1296*I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e
^2*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 3240*sqrt(b*arcsin(d*x + c) + a)
*a*b^2*e^2*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 1296*I*sqrt(b*arcsin(d*x
 + c) + a)*a^2*b*e^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 3240*sqrt(b*a
rcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) - 432*
I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*arcsin(d*x + c)*e^(-3*I*arcsin(d*x
+ c)) - 360*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)*e^(-3*I*a
rcsin(d*x + c)) + 864*sqrt(pi)*a^4*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x +
 c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b)
)*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 1728*I*sqrt(pi
)*a^3*b*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sq
rt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt
(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 648*sqrt(pi)*a^2*b^2*e^2*erf(-1/2*sqrt(6)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c)
 + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(
b)) - 864*sqrt(pi)*a^4*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/s
qrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*
a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 864*sqrt(pi)*a^4*e
^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(
abs(b)) + sqrt(2)*sqrt(abs(b))) + 864*sqrt(pi)*a^4*e^2*erf(-1/2*sqrt(6)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a
)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b))
 - 1728*I*sqrt(pi)*a^3*b*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/s
qrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*
a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) + 648*sqrt(pi)*a^2*b^2*e^
2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt
(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*s
qrt(6)*b^(3/2)/abs(b)) - 432*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)
*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) + 180*I*sqrt(pi
)*a*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*
I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)
+ I*sqrt(6)*b/abs(b)) - 432*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*
sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6) - I*sqrt(6)*b/abs(b)) - 180*I*sqrt(pi
)*a*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*
I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)
 - I*sqrt(6)*b/abs(b)) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^2*e^(3*I*a
rcsin(d*x + c)) - 144*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*e^(3*I*arcsin(d
*x + c)) - 180*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*e^(3*I*arcsin(d*x +
c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^2*e^(I*arcsin(d*x + c)) + 129
6*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*e^(I*arcsin(d*x + c)) + 4860*I*sqrt
(b*arcsin(d*x + c) + a)*a*b^2*e^2*e^(I*arcsin(d*x + c)) + 432*I*sqrt(b*arcs

in(d*x + c) + a)*a^3*e^2*e^(-I*arcsin(d*x + c)) + 1296*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*e^(-I*arcsin(d*x + c)) - 4860*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*e^(-I*arcsin(d*x + c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^2*e^(-3*I*arcsin(d*x + c)) - 144*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^2*e^(-3*I*arcsin(d*x + c)) + 180*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*e^(-3*I*arcsin(d*x + c)) + (432*sqrt(2)*sqrt(pi)*a^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 432*sqrt(2)*sqrt(pi)*a^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 648*I*sqrt(2)*sqrt(pi)*a^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 648*I*sqrt(2)*sqrt(pi)*a^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(-3*I*arcsin(d*x + c)) - 972*sqrt(2)*sqrt(pi)*a^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 810*I*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 972*sqrt(2)*sqrt(pi)*a^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 810*I*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) - 120*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(3*I*arcsin(d*x + c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(3*I*arcsin(d*x + c))/b + 1080*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(I*arcsin(d*x + c))/b + 1080*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c))/b - 120*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(-3*I*arcsin(d*x + c)) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(-3*I*arcsin(d*x + c))/b + 216*sqrt(pi)*a^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 216*sqrt(pi)*a^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) - 864*sqrt(pi)*a^4*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x +

c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b^(5/2)*(sqrt(6) + I*sqrt(6)*b/abs(b))
) - 432*I*sqrt(pi)*a^3*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b
^(3/2)*(sqrt(6) + I*sqrt(6)*b/abs(b))) + 60*I*sqrt(pi)*a*sqrt(b)*erf(-1/2*s
qrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*
x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) - 86
4*sqrt(pi)*a^4*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I
*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(b^(5/2)*
(sqrt(6) - I*sqrt(6)*b/abs(b))) + 432*I*sqrt(pi)*a^3*erf(-1/2*sqrt(6)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*
sqrt(b)/abs(b))*e^(-3*I*a/b)/(b^(3/2)*(sqrt(6) - I*sqrt(6)*b/abs(b))) - 60*
I*sqrt(pi)*a*sqrt(b)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sq
rt(6) - I*sqrt(6)*b/abs(b)) - 60*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(3*I*arc
sin(d*x + c)) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(3*I*arcsin(d*x + c
))/b^2 + 96*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(3*I*arcsin(d*x + c))/b + 162
0*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(I*arcsin(d*x + c)) - 432*I*sqrt(b*arcs
in(d*x + c) + a)*a^3*e^(I*arcsin(d*x + c))/b^2 - 864*sqrt(b*arcsin(d*x + c)
 + a)*a^2*e^(I*arcsin(d*x + c))/b - 1620*I*sqrt(b*arcsin(d*x + c) + a)*a*e^
(-I*arcsin(d*x + c)) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(-I*arcsin(d
*x + c))/b^2 - 864*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(-I*arcsin(d*x + c))/b
 + 60*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(-3*I*arcsin(d*x + c)) - 144*I*sqrt
(b*arcsin(d*x + c) + a)*a^3*e^(-3*I*arcsin(d*x + c))/b^2 + 96*sqrt(b*arcsin
(d*x + c) + a)*a^2*e^(-3*I*arcsin(d*x + c))/b - (-144*I*sqrt(b*arcsin(d*x +
 c) + a)*arcsin(d*x + c)^3*e^(3*I*arcsin(d*x + c)) + 432*I*sqrt(b*arcsin(d*
x + c) + a)*arcsin(d*x + c)^3*e^(I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d
*x + c) + a)*arcsin(d*x + c)^3*e^(-I*arcsin(d*x + c)) + 144*I*sqrt(b*arcsin
(d*x + c) + a)*arcsin(d*x + c)^3*e^(-3*I*arcsin(d*x + c)) + 168*sqrt(b*arcs
in(d*x + c) + a)*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c)) + 144*I*sqrt(b*a
rcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c))/b - 1512*sq
rt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) - 432*I*s
qrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c))/b - 15
12*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c)) + 4
32*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(-I*arcsin(d*x + c))
/b + 168*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)^2*e^(-3*I*arcsin(d*x +
 c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)^2*e^(-3*I*arcsin
(d*x + c))/b - 3240*I*sqrt(2)*sqrt(pi)*a*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(ab
s(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 432*sqrt(2)*sqrt(pi)
*a^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(b^3*(I*b/sqrt(ab
s(b)) + sqrt(abs(b)))) + 864*I*sqrt(2)*sqrt(pi)*a^3*erf(-1/2*I*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(I*a/b)/(b^2*(I*b/sqrt(abs(b)) + sqrt(abs(b)))) - 194
4*sqrt(2)*sqrt(pi)*a^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(

abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)
/(b*(I*b/sqrt(abs(b)) + sqrt(abs(b)))) + 2835*sqrt(2)*sqrt(pi)*b*erf(-1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))
) + 3240*I*sqrt(2)*sqrt(pi)*a*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 432*sqrt(2)*sqrt(pi)*a^4*erf(1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(b^3*(-I*b/sqrt(abs(b)) + s
qrt(abs(b)))) - 864*I*sqrt(2)*sqrt(pi)*a^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(a
bs(b))/b)*e^(-I*a/b)/(b^2*(-I*b/sqrt(abs(b)) + sqrt(abs(b)))) - 1944*sqrt(2
)*sqrt(pi)*a^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(b*(-I*
b/sqrt(abs(b)) + sqrt(abs(b)))) + 2835*sqrt(2)*sqrt(pi)*b*erf(1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 14
0*I*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)*e^(3*I*arcsin(d*x + c)) - 1
44*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(3*I*arcsin(d*x + c)
)/b^2 - 144*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(3*I*arcsin(d*x
 + c))/b - 3780*I*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)*e^(I*arcsin(d
*x + c)) + 432*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*e^(I*arcsi
n(d*x + c))/b^2 + 1296*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x + c)*e^(I*a
rcsin(d*x + c))/b + 3780*I*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*x + c)*e^(-
I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arcsin(d*x + c)*
e^(-I*arcsin(d*x + c))/b^2 + 1296*sqrt(b*arcsin(d*x + c) + a)*a*arcsin(d*x
+ c)*e^(-I*arcsin(d*x + c))/b - 140*I*sqrt(b*arcsin(d*x + c) + a)*arcsin(d*
x + c)*e^(-3*I*arcsin(d*x + c)) + 144*I*sqrt(b*arcsin(d*x + c) + a)*a^2*arc
sin(d*x + c)*e^(-3*I*arcsin(d*x + c))/b^2 - 144*sqrt(b*arcsin(d*x + c) + a)
*a*arcsin(d*x + c)*e^(-3*I*arcsin(d*x + c))/b - 864*sqrt(pi)*a^4*erf(-1/2*s
qrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*
x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b^(7/2)*(sqrt(6) + I*sqrt(6)*b/abs
(b))) - 576*I*sqrt(pi)*a^3*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b
)/(b^(5/2)*(sqrt(6) + I*sqrt(6)*b/abs(b))) + 432*sqrt(pi)*a^2*erf(-1/2*sqrt
(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b^(3/2)*(sqrt(6) + I*sqrt(6)*b/abs(b)
)) + 240*I*sqrt(pi)*a*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
- 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sq
rt(b)*(sqrt(6) + I*sqrt(6)*b/abs(b))) - 70*sqrt(pi)*sqrt(b)*erf(-1/2*sqrt(6
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) - 864*sqr
t(pi)*a^4*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt
(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(b^(7/2)*(sqrt
(6) - I*sqrt(6)*b/abs(b))) + 576*I*sqrt(pi)*a^3*erf(-1/2*sqrt(6)*sqrt(b*arc

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sin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(
b)/abs(b))*e^(-3*I*a/b)/(b^(5/2)*(sqrt(6) - I*sqrt(6)*b/abs(b))) + 432*sqrt
(pi)*a^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(
6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(b^(3/2)*(sqrt(
6) - I*sqrt(6)*b/abs(b))) - 240*I*sqrt(pi)*a*erf(-1/2*sqrt(6)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-3*I*a/b)/(sqrt(b)*(sqrt(6) - I*sqrt(6)*b/abs(b))) - 70*sqrt(pi)
*sqrt(b)*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(
6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6) - I*sq
rt(6)*b/abs(b)) - 70*sqrt(b*arcsin(d*x + c) + a)*e^(3*I*arcsin(d*x + c)) +
144*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(3*I*arcsin(d*x + c))/b^3 + 120*sqr
t(b*arcsin(d*x + c) + a)*a^2*e^(3*I*arcsin(d*x + c))/b^2 - 100*I*sqrt(b*arc
sin(d*x + c) + a)*a*e^(3*I*arcsin(d*x + c))/b + 5670*sqrt(b*arcsin(d*x + c)
 + a)*e^(I*arcsin(d*x + c)) - 432*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(I*ar
csin(d*x + c))/b^3 - 1080*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(I*arcsin(d*x +
 c))/b^2 + 2700*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(I*arcsin(d*x + c))/b + 5
670*sqrt(b*arcsin(d*x + c) + a)*e^(-I*arcsin(d*x + c)) + 432*I*sqrt(b*arcsi
n(d*x + c) + a)*a^3*e^(-I*arcsin(d*x + c))/b^3 - 1080*sqrt(b*arcsin(d*x + c
) + a)*a^2*e^(-I*arcsin(d*x + c))/b^2 - 2700*I*sqrt(b*arcsin(d*x + c) + a)*
a*e^(-I*arcsin(d*x + c))/b - 70*sqrt(b*arcsin(d*x + c) + a)*e^(-3*I*arcsin(
d*x + c)) - 144*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(-3*I*arcsin(d*x + c))/
b^3 + 120*sqrt(b*arcsin(d*x + c) + a)*a^2*e^(-3*I*arcsin(d*x + c))/b^2 + 10
0*I*sqrt(b*arcsin(d*x + c) + a)*a*e^(-3*I*arcsin(d*x + c))/b)*b)*b^2*e^2)/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

```
[In] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(7/2),x)
[Out] int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(7/2), x)
```

3.256 $\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 301

$$\begin{aligned}\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx = &-\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d}\\ &+\frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d}-\frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d}\\ &+\frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d}\\ &-\frac{e(a+b\arcsin(c+dx))^{7/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d}\\ &+\frac{105b^{7/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{512d}\\ &-\frac{105b^{7/2}e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{512d}\end{aligned}$$

```
[Out] 35/64*b^2*e*(a+b*arcsin(d*x+c))^(3/2)/d-35/32*b^2*e*(d*x+c)^2*(a+b*arcsin(d
*x+c))^(3/2)/d-1/4*e*(a+b*arcsin(d*x+c))^(7/2)/d+1/2*e*(d*x+c)^2*(a+b*arcsi
n(d*x+c))^(7/2)/d+105/512*b^(7/2)*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c
))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d-105/512*b^(7/2)*e*FresnelC(2*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+7/8*b*e*(d*x+c)*(
a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/128*b^3*e*(d*x+c)*(1-(d*
x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.522$, Rules used = {4889, 12, 4725, 4795, 4737, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx = -\frac{105\sqrt{\pi}b^{7/2}e\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{512d} + \frac{105\sqrt{\pi}b^{7/2}e\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{512d} - \frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d}$$

```
[In] Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-105*b^3*e*(c + d*x)*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(1
28*d) + (35*b^2*e*(a + b*ArcSin[c + d*x])^(3/2))/(64*d) - (35*b^2*e*(c + d*
x)^2*(a + b*ArcSin[c + d*x])^(3/2))/(32*d) + (7*b*e*(c + d*x)*Sqrt[1 - (c +
 d*x)^2]*(a + b*ArcSin[c + d*x])^(5/2))/(8*d) - (e*(a + b*ArcSin[c + d*x])^
(7/2))/(4*d) + (e*(c + d*x)^2*(a + b*ArcSin[c + d*x])^(7/2))/(2*d) + (105*b
^(7/2)*e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sq
rt[b]*Sqrt[Pi])])/(512*d) - (105*b^(7/2)*e*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*
ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(512*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ex(a+b\arcsin(x))^{7/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int x(a+b\arcsin(x))^{7/2}\,dx,x,c+dx\right)}{d}\\
&= \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d}-\frac{(7be)\text{Subst}\left(\int \frac{x^2(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{4d}\\
&= \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d}\\
&\quad+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d}-\frac{(7be)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{8d}\\
&\quad-\frac{(35b^2e)\,\text{Subst}\left(\int x(a+b\arcsin(x))^{3/2}\,dx,x,c+dx\right)}{16d}\\
&= -\frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d}\\
&\quad+\frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d}\\
&\quad-\frac{e(a+b\arcsin(c+dx))^{7/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d}\\
&\quad+\frac{(105b^3e)\,\text{Subst}\left(\int \frac{x^2\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{64d}
\end{aligned}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} + \frac{(105b^3e)\operatorname{Subst}\left(\int \frac{\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{128d} + \frac{(105b^4e)\operatorname{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{256d}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} - \frac{(105b^3e)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} - \frac{(105b^3e)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{256d}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} - \frac{(105b^3e)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} + \frac{\left(105b^3e\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d} - \frac{\left(105b^3e\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{512d}$$

$$= -\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} + \frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d} - \frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} - \frac{e(a+b\arcsin(c+dx))^{7/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} + \frac{\left(105b^3e\cos\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{256d} - \frac{\left(105b^3e\sin\left(\frac{2a}{b}\right)\right)\operatorname{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{256d}$$

$$=-\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d}+\frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d}-\frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d}+\frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d}-\frac{e(a+b\arcsin(c+dx))^{7/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d}+\frac{105b^{7/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{512d}-\frac{105b^{7/2}e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{512d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.10 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.46

$$\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx=-\frac{b^4ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{64\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2),x]
[Out] -1/64*(b^4*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[9/2, ((-2*I)*(a
+ b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))
/b]*Gamma[9/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)*a)
/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 653 vs. 2(249) = 498.

Time = 0.92 (sec) , antiderivative size = 654, normalized size of antiderivative = 2.17

method	result
default	$eb\Big(128\sqrt{a+b\arcsin(dx+c)}\sqrt{\pi}\sqrt{-\frac{1}{b}}\arcsin(dx+c)^3\cos\left(-\frac{2(a+b\arcsin(dx+c))}{b}+\frac{2a}{b}\right)b^3+384\sqrt{a+b\arcsin(dx+c)}\sqrt{\pi}\sqrt{-\frac{1}{b}}\arcsin(dx+$

```
[In] int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/512*e/d*b*(128*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x
+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+384*(a+b*arcsin(d*x+c))^(1/2)
*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*
a*b^2+224*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)^2*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+384*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/
2)*(-1/b)^(1/2)*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-280
*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)*cos(-2*(a+b*
arcsin(d*x+c))/b+2*a/b)*b^3+448*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(
1/2)*arcsin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+128*(a+b*arcsi
n(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a
^3-280*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*cos(-2*(a+b*arcsin(d
*x+c))/b+2*a/b)*a*b^2+224*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-210*(a+b*arcsin(d*x+c))^(1/2)*Pi^(
1/2)*(-1/b)^(1/2)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-105*Pi*b^3*cos(2*
a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-
105*Pi*b^3*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)/b))*(-1/b)^(1/2)/Pi^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx = \int (dex + ce)(b\arcsin(dx + c) + a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.34 (sec) , antiderivative size = 2561, normalized size of antiderivative = 8.51

$$\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx = \text{Too large to display}$$

```
[In] integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] -1/1024*(128*sqrt(b*arcsin(d*x + c) + a)*b^3*e*arcsin(d*x + c)^3*e^(2*I*arc
sin(d*x + c)) + 128*sqrt(b*arcsin(d*x + c) + a)*b^3*e*arcsin(d*x + c)^3*e^(
-2*I*arcsin(d*x + c)) + 384*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e*arcsin(d*x
+ c)^2*e^(2*I*arcsin(d*x + c)) + 224*I*sqrt(b*arcsin(d*x + c) + a)*b^3*e*ar
csin(d*x + c)^2*e^(2*I*arcsin(d*x + c)) + 384*sqrt(b*arcsin(d*x + c) + a)*a
*b^2*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c)) - 224*I*sqrt(b*arcsin(d*x
 + c) + a)*b^3*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c)) + 768*I*sqrt(pi
)*a^4*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x +
c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(3/2) + I*b^(5/2)/abs(b)) + 192*sqrt
(pi)*a^3*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d
*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(3/2) + I*b^(5/2)/abs(b)) - 768
*I*sqrt(pi)*a^4*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arc
sin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b^(3/2) - I*b^(5/2)/abs(b))
 + 192*sqrt(pi)*a^3*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt
(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b^(3/2) - I*b^(5/2)/a
bs(b)) - 256*I*sqrt(pi)*a^4*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b + I*b^2/
abs(b)) + 832*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(
b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b + I*b^2/a
bs(b)) - 288*I*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b + I*b^2/
abs(b)) + 256*I*sqrt(pi)*a^4*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^
2/abs(b)) + 832*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*b^
```

2/abs(b)) + 288*I*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/s
qrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b - I*
b^2/abs(b)) + 384*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e*arcsin(d*x + c)*e^(2*
I*arcsin(d*x + c)) + 448*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e*arcsin(d*x +
 c)*e^(2*I*arcsin(d*x + c)) - 280*sqrt(b*arcsin(d*x + c) + a)*b^3*e*arcsin(
d*x + c)*e^(2*I*arcsin(d*x + c)) + 384*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e*
arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c)) - 448*I*sqrt(b*arcsin(d*x + c) + a
)*a*b^2*e*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c)) - 280*sqrt(b*arcsin(d*x
+ c) + a)*b^3*e*arcsin(d*x + c)*e^(-2*I*arcsin(d*x + c)) - 768*sqrt(pi)*a^3
*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) +
a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b) + I*b^(3/2)/abs(b)) + 576*I*sqrt(pi
)*a^2*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b) + I*b^(3/2)/abs(b)) + 240*sq
rt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d
*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b) + I*b^(3/2)/abs(b)) - 256
*I*sqrt(pi)*a^4*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b) - I*b^(3/2)/abs(b)) -
 768*sqrt(pi)*a^3*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*a
rcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b) - I*b^(3/2)/abs(b
)) - 576*I*sqrt(pi)*a^2*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*
sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b) - I*b^(3/
2)/abs(b)) + 240*sqrt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
+ I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b) - I*b
^(3/2)/abs(b)) - 512*I*sqrt(pi)*a^4*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*(I
*b/abs(b) + 1)) - 256*sqrt(pi)*a^3*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) +
a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b
/abs(b) + 1) - 288*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a
)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b/
abs(b) + 1) - 240*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqr
t(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b/abs(b
) + 1) + 105*I*sqrt(pi)*b^(7/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
- I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(I*b/abs(b) + 1
) + 768*I*sqrt(pi)*a^4*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(
b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(sqrt(b)*(-I*b/abs(b) +
 1)) - 256*sqrt(pi)*a^3*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
+ I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) +
 1) + 288*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b)
+ 1) - 240*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) + 1
) - 105*I*sqrt(pi)*b^(7/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*s
qrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(-I*b/abs(b) + 1) +
 128*sqrt(b*arcsin(d*x + c) + a)*a^3*e*e^(2*I*arcsin(d*x + c)) + 224*I*sqrt
(b*arcsin(d*x + c) + a)*a^2*b*e*e^(2*I*arcsin(d*x + c)) - 280*sqrt(b*arcsin

```
(d*x + c) + a)*a*b^2*e*e^(2*I*arcsin(d*x + c)) - 210*I*sqrt(b*arcsin(d*x +
c) + a)*b^3*e*e^(2*I*arcsin(d*x + c)) + 128*sqrt(b*arcsin(d*x + c) + a)*a^3
*e*e^(-2*I*arcsin(d*x + c)) - 224*I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e*e^(
-2*I*arcsin(d*x + c)) - 280*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e*e^(-2*I*arc
sin(d*x + c)) + 210*I*sqrt(b*arcsin(d*x + c) + a)*b^3*e*e^(-2*I*arcsin(d*x
+ c)))/d
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^{7/2}\,dx$$

```
[In] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2),x)
[Out] int((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2), x)
```

3.257 $\int (a+b\arcsin(c+dx))^{7/2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 243

$$\begin{aligned}\int (a+b\arcsin(c+dx))^{7/2}\,dx = &-\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}\\ &-\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d}\\ &+\frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}\\ &+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d}\\ &+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}\end{aligned}$$

```
[Out] -35/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d+(d*x+c)*(a+b*arcsin(d*x+c))^(
7/2)/d+105/16*b^(7/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/16*b^(7/2)*FresnelS(2^(1/2)/Pi^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/2*b*(a+b
*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/8*b^3*(1-(d*x+c)^2)^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {4887, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\frac{105\sqrt{\frac{\pi}{2}}b^{7/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d}+\frac{105\sqrt{\frac{\pi}{2}}b^{7/2}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d}-\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}-\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-105*b^3*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]])/(8*d) - (35*b^
2*(c + d*x)*(a + b*ArcSin[c + d*x])^(3/2))/(4*d) + (7*b*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^(5/2))/(2*d) + ((c + d*x)*(a + b*ArcSin[c + d*x]
)^(7/2))/d + (105*b^(7/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]])/(8*d) + (105*b^(7/2)*Sqrt[Pi/2]*FresnelS[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(8*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int (a+b\arcsin(x))^{7/2}\,dx, x, c+dx\right)}{d}\\ &= \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} - \frac{(7b)\text{Subst}\left(\int \frac{x(a+b\arcsin(x))^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{2d}\\ &= \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}\\ &\quad - \frac{(35b^2)\,\text{Subst}\left(\int (a+b\arcsin(x))^{3/2}\,dx, x, c+dx\right)}{4d}\end{aligned}$$

$$= -\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^3)\operatorname{Subst}\left(\int \frac{x\sqrt{a+b\arcsin(x)}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{8d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^4)\operatorname{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{(105b^3)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{\left(105b^3\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d} + \frac{\left(105b^3\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{16d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{\left(105b^3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{8d} + \frac{\left(105b^3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{8d}$$

$$= -\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} + \frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} + \frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 3.20 (sec) , antiderivative size = 545, normalized size of antiderivative = 2.24

$$\int(a+b\arcsin(c+dx))^{7/2}\,dx = \frac{e^{-\frac{ia}{b}}\left(\sqrt{b}\left(8ia^3\left(-1+e^{\frac{2ia}{b}}\right)+105b^3\left(1+e^{\frac{2ia}{b}}\right)\right)\sqrt{\frac{\pi}{2}}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+\cdots}}{\cdots}\right.\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (Sqrt[b]*((8*I)*a^3*(-1 + E^(((2*I)*a)/b)) + 105*b^3*(1 + E^(((2*I)*a)/b)))
*Sqrt[Pi/2]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*Arc
Sin[c + d*x]])/Sqrt[b]] + 2*b*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(7*(-10*
a*b*(c + d*x) + 4*a^2*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] - 15*b^2*Sqrt[1 - c
^2 - 2*c*d*x - d^2*x^2]) + (24*a^2*(c + d*x) - 70*b^2*(c + d*x) + 56*a*b*Sq
rt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + 4*b*(6*a*(c + d*x) + 7*b
```

```
*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x]^2 + 8*b^2*(c + d*x)*Arc
Sin[c + d*x]^3) + 4*a^3*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (
(-I)*(a + b*ArcSin[c + d*x]))/b] + 4*a^3*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*Arc
Sin[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]) + Sqrt[b]*Sqrt
[2*Pi]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]]*(4*a^3*(1 + E^(((2*I)*a)/b)) + 105*b^3*E^((I*a)/b)*Sin[a
/b]))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 615 vs. $2(197) = 394$.

Time = 0.36 (sec) , antiderivative size = 616, normalized size of antiderivative = 2.53

method	result
default	$-\frac{-105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^4+105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\right.}{}$

```
[In] int((a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/d*(-105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)/
Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4
+105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/
(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+16*arcsi
n(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+64*arcsin(d*x+c)^3*sin(-(a+b
*arcsin(d*x+c))/b+a/b)*a*b^3-56*arcsin(d*x+c)^3*cos(-(a+b*arcsin(d*x+c))/b+
a/b)*b^4+96*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-140*arc
sin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-168*arcsin(d*x+c)^2*cos(-(
a+b*arcsin(d*x+c))/b+a/b)*a*b^3+64*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b
+a/b)*a^3*b-280*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-168*arc
sin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+210*arcsin(d*x+c)*cos(-(
a+b*arcsin(d*x+c))/b+a/b)*b^4+16*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^4-140*si
n(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-56*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^
3*b+210*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3)/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{7}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.54 (sec) , antiderivative size = 2308, normalized size of antiderivative = 9.50

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\text{Too large to display}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] -1/32*(16*sqrt(2)*sqrt(pi)*a^4*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/(I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b))) + 16*sqrt(2)*sqrt(pi)*
a^4*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^4/sqrt(a
bs(b)) + b^3*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4*b^2*erf(-1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))
+ 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4
*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(
b)) + b^2*sqrt(abs(b))) - 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c
```

) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))
+ 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e^(I*arcsin(d*x +
c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e^(-I*arcsin(d
*x + c)) + 32*sqrt(2)*sqrt(pi)*a^4*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 128*I*sqrt(2)*sqrt(p
i)*a^3*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt
(abs(b)) + b*sqrt(abs(b))) - 72*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) +
32*sqrt(2)*sqrt(pi)*a^4*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a
/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 128*I*sqrt(2)*sqrt(pi)*a^3*b^2
*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b))
+ b*sqrt(abs(b))) - 72*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*s
qrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 48*I*sqr
t(b*arcsin(d*x + c) + a)*a*b^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) - 56
*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) -
48*I*sqrt(b*arcsin(d*x + c) + a)*a*b^2*arcsin(d*x + c)^2*e^(-I*arcsin(d*x +
c)) - 56*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^2*e^(-I*arcsin(d*
x + c)) + 96*I*sqrt(2)*sqrt(pi)*a^3*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 72*sqrt(2)*sqrt(pi)*a^2
*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b))
+ sqrt(abs(b))) + 105*sqrt(2)*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 96*I*sqrt(2)*sqrt
(pi)*a^3*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(
abs(b)) + sqrt(abs(b))) + 72*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 105*sq
rt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I
*b/sqrt(abs(b)) + sqrt(abs(b))) + 48*I*sqrt(b*arcsin(d*x + c) + a)*a^2*b*ar
csin(d*x + c)*e^(I*arcsin(d*x + c)) - 112*sqrt(b*arcsin(d*x + c) + a)*a*b^2
*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) - 140*I*sqrt(b*arcsin(d*x + c) + a)*
b^3*arcsin(d*x + c)*e^(I*arcsin(d*x + c)) - 48*I*sqrt(b*arcsin(d*x + c) + a
)*a^2*b*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) - 112*sqrt(b*arcsin(d*x + c)
+ a)*a*b^2*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 140*I*sqrt(b*arcsin(d*
x + c) + a)*b^3*arcsin(d*x + c)*e^(-I*arcsin(d*x + c)) + 32*sqrt(pi)*a^4*er

```
f(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)
) + sqrt(2)*sqrt(abs(b))) + 32*sqrt(pi)*a^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(
abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) +
16*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(I*arcsin(d*x + c)) - 56*sqrt(b*arcs
in(d*x + c) + a)*a^2*b*e^(I*arcsin(d*x + c)) - 140*I*sqrt(b*arcsin(d*x + c)
 + a)*a*b^2*e^(I*arcsin(d*x + c)) + 210*sqrt(b*arcsin(d*x + c) + a)*b^3*e^(
I*arcsin(d*x + c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*a^3*e^(-I*arcsin(d*x
+ c)) - 56*sqrt(b*arcsin(d*x + c) + a)*a^2*b*e^(-I*arcsin(d*x + c)) + 140*I
*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^(-I*arcsin(d*x + c)) + 210*sqrt(b*arcs
in(d*x + c) + a)*b^3*e^(-I*arcsin(d*x + c)))/d
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(7/2),x)
[Out] int((a + b*asin(c + d*x))^(7/2), x)
```

3.258 $\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\frac{\operatorname{Int}\left(\frac{(a+b\arcsin(c+dx))^{7/2}}{c+dx},x\right)}{e}$$

```
[Out] Unintegrable((a+b*arcsin(d*x+c))^(7/2)/(d*x+c),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x),x]
[Out] Defer[Subst][Defer[Int][(a + b*ArcSin[x])^(7/2)/x, x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{7/2}}{ex}\,dx,x,c+dx\right)}{d}\\&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^{7/2}}{x}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.70 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{7}{2}}}{dex+ce}dx$$

```
[In] int((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x)
[Out] int((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))**(7/2)/(d*e*x+c*e),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 2.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(7/2)/(d*e*x + c*e), x)
```

Giac [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}{dex+ce}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(7/2)/(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^{7/2}}{c\,e+d\,e\,x}\,dx$$

```
[In] int((a + b*asin(c + d*x))^(7/2)/(c*e + d*e*x),x)
[Out] int((a + b*asin(c + d*x))^(7/2)/(c*e + d*e*x), x)
```

3.259 $\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 365

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e^4\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4\sqrt{b}d} - \frac{e^4\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^4\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^4\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4\sqrt{b}d} - \frac{e^4\sqrt{\frac{3\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{8\sqrt{b}d} + \frac{e^4\sqrt{\frac{\pi}{10}}\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{8\sqrt{b}d}$$

```
[Out] 1/80*e^4*cos(5*a/b)*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2))*10^(1/2)*Pi^(1/2)/d/b^(1/2)+1/80*e^4*FresnelS(10^(1/2)/Pi^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/d/b^(1/2)+1/8*e
^4*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^
(1/2)*Pi^(1/2)/d/b^(1/2)+1/8*e^4*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
```

```
c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)-1/16*e^4*cos(3*a/b)*
FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/
2)/d/b^(1/2)-1/16*e^4*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4889, 12, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}dx = \frac{\sqrt{\frac{\pi}{2}}e^4\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4\sqrt{b}d} - \frac{\sqrt{\frac{3\pi}{2}}e^4\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{\sqrt{\frac{\pi}{10}}e^4\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{\sqrt{\frac{\pi}{2}}e^4\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4\sqrt{b}d} - \frac{\sqrt{\frac{3\pi}{2}}e^4\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{\sqrt{\frac{\pi}{10}}e^4\sin\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d}$$

```
[In] Int[(c*e + d*e*x)^4/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (e^4*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/(4*Sqrt[b]*d) - (e^4*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(8*Sqrt[b]*d) + (e^4*Sqrt[Pi/10
]*Cos[(5*a)/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])
/(8*Sqrt[b]*d) + (e^4*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
 d*x]])/Sqrt[b]]*Sin[a/b])/(4*Sqrt[b]*d) - (e^4*Sqrt[(3*Pi)/2]*FresnelS[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(8*Sqrt[b]*d)
+ (e^4*Sqrt[Pi/10]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[
b]]*Sin[(5*a)/b])/(8*Sqrt[b]*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^4x^4}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{x^4}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^4\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{bd}\\
&= \frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}\\
&\quad+\frac{e^4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{(3e^4)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}\\
&= \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{\left(3e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}\\
&\quad+\frac{\left(e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}\\
&\quad+\frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{8bd}\\
&\quad-\frac{\left(3e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}\\
&\quad+\frac{\left(e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{16bd}
\end{aligned}
$$

$$= \frac{\left(e^4 \cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4bd} - \frac{\left(3e^4 \cos\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8bd} + \frac{\left(e^4 \cos\left(\frac{5a}{b}\right)\right) \text{Subst}\left(\int \cos\left(\frac{5x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8bd} + \frac{\left(e^4 \sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4bd} - \frac{\left(3e^4 \sin\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8bd} + \frac{\left(e^4 \sin\left(\frac{5a}{b}\right)\right) \text{Subst}\left(\int \sin\left(\frac{5x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{8bd}$$

$$= \frac{e^4 \sqrt{\frac{\pi}{2}} \cos\left(\frac{a}{b}\right) \text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4\sqrt{b}d} - \frac{e^4 \sqrt{\frac{3\pi}{2}} \cos\left(\frac{3a}{b}\right) \text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^4 \sqrt{\frac{\pi}{10}} \cos\left(\frac{5a}{b}\right) \text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^4 \sqrt{\frac{\pi}{2}} \text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right) \sin\left(\frac{a}{b}\right)}{4\sqrt{b}d} - \frac{e^4 \sqrt{\frac{3\pi}{2}} \text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right) \sin\left(\frac{3a}{b}\right)}{8\sqrt{b}d} + \frac{e^4 \sqrt{\frac{\pi}{10}} \text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right) \sin\left(\frac{5a}{b}\right)}{8\sqrt{b}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.30 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.01

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{ie^4e^{-\frac{5ia}{b}}\left(-10e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+10e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx}{b}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((I/160)*e^4*(-10*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Ga
mma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 10*E^(((6*I)*a)/b)*Sqrt[(I*(a
+ b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] + 5*Sqrt
[3]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*
I)*(a + b*ArcSin[c + d*x]))/b] - 5*Sqrt[3]*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*A
rcSin[c + d*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b] - Sqrt[5]
*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c
+ d*x]))/b] + Sqrt[5]*E^(((10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[1/2, ((5*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((5*I)*a)/b)*Sqrt[a +
 b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 317, normalized size of antiderivative = 0.87

method	result
default	$-\frac{e^4\sqrt{2}\sqrt{\pi}\sqrt{-\frac{5}{b}}\left(2\sqrt{-\frac{1}{b}}\sqrt{-\frac{5}{b}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)b-2\sqrt{-\frac{1}{b}}\sqrt{-\frac{5}{b}}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)b\right.}{}$

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/80*e^4/d*2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(2*(-1/b)^(1/2)*(-5/b)^(1/2)*cos(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-
2*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*b-(-3/b)^(1/2)*(-5/b)^(1/2)*cos(3*a/b)*Fresne
lC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+(-3/b)^(1
/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*b-cos(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^4\left(\int \frac{c^4}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{d^4x^4}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{4cd^3x^3}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{6c^2d^2x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{4c^3dx}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**(1/2),x)
[Out] e**4*(Integral(c**4/sqrt(a + b*asin(c + d*x)), x) + Integral(d**4*x**4/sqrt
(a + b*asin(c + d*x)), x) + Integral(4*c*d**3*x**3/sqrt(a + b*asin(c + d*x)
), x) + Integral(6*c**2*d**2*x**2/sqrt(a + b*asin(c + d*x)), x) + Integral(
4*c**3*d*x/sqrt(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^4}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^4/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.82 (sec) , antiderivative size = 507, normalized size of antiderivative = 1.39

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= -\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{10}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{10}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{5ia}{b}\right)}}{16\left(\sqrt{10}\sqrt{b}+\frac{i\sqrt{10}b^{\frac{3}{2}}}{|b|}\right)d}$$
$$+\frac{\sqrt{6}\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{32\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{8d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{8d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$+\frac{\sqrt{6}\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{32\sqrt{b}d\left(-\frac{ib}{|b|}+1\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{10}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{10}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{5ia}{b}\right)}}{16\left(\sqrt{10}\sqrt{b}-\frac{i\sqrt{10}b^{\frac{3}{2}}}{|b|}\right)d}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -1/16*sqrt(pi)*e^4*erf(-1/2*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
1/2*I*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(5*I*a/b)/((sq
rt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b))*d) + 1/32*sqrt(6)*sqrt(pi)*e^4*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(b)*d*(I*b/abs(b) +
1)) - 1/8*sqrt(pi)*e^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(
abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)
/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/8*sqrt(pi)*e^4*e
rf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(a
bs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/32*sqrt(6)*sqrt(pi)*e^4*erf(-1/2*sqrt(6
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(b)*d*(-I*b/abs(b) + 1)) - 1/16*sq
rt(pi)*e^4*erf(-1/2*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sq
```

```
rt(10)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b)/((sqrt(10)*
sqrt(b) - I*sqrt(10)*b^(3/2)/abs(b))*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{(c\,e+d\,e\,x)^4}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(1/2), x)
```

3.260 $\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 233

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4\sqrt{b}d} - \frac{e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4\sqrt{b}d} + \frac{e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{8\sqrt{b}d}$$

```
[Out] -1/16*e^3*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b^(1/2))*2^(1/2)*Pi^(1/2)/d/b^(1/2)+1/16*e^3*FresnelC(2*2^(1/2)/Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)+1/4*
e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1
/2)/d/b^(1/2)-1/4*e^3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2)
)*sin(2*a/b)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4889, 12, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{\sqrt{\pi}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4\sqrt{b}d} + \frac{\sqrt{\frac{\pi}{2}}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} - \frac{\sqrt{\frac{\pi}{2}}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{\sqrt{\pi}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4\sqrt{b}d}$$

```
[In] Int[(c*e + d*e*x)^3/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] -1/8*(e^3*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]])/(Sqrt[b]*d) + (e^3*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*S
qrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(4*Sqrt[b]*d) - (e^3*Sqrt[
Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/
b])/(4*Sqrt[b]*d) + (e^3*Sqrt[Pi/2]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSi
n[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/(8*Sqrt[b]*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^3x^3}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^3\text{Subst}\left(\int \frac{x^3}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}$$

$$= -\frac{e^3 \text{Subst}\left(\int \left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4\sqrt{x}}\right) dx, x, a+b\arcsin(c+dx)\right)}{bd}$$

$$= \frac{e^3 \text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{8bd} - \frac{e^3 \text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{4bd}$$

$$= \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{4bd} - \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{8bd} - \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{4bd} + \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(c+dx)\right)}{8bd}$$

$$= \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd} - \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \sin\left(\frac{4x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4bd} - \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right) \text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2bd} + \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right) \text{Subst}\left(\int \cos\left(\frac{4x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4bd}$$

$$= -\frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right) \text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right) \text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4\sqrt{b}d} - \frac{e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4\sqrt{b}d} + \frac{e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{8\sqrt{b}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.07

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e^3 e^{-\frac{4ia}{b}}\left(-2\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-2\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin}{b}\right.\right.}{32d\sqrt{a+b\,\mathrm{arc}}}$$

```
[In] Integrate[(c*e + d*e*x)^3/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (e^3*(-2*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gam
ma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 2*Sqrt[2]*E^(((6*I)*a)/b)*Sqr
t[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))
/b] + Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*ArcS
in[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(32*d*E^(((4*I)*a)/b)*Sqrt[a +
b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.80

method	result
default	$-\frac{e^3\sqrt{\pi}\sqrt{-\frac{1}{b}}\left(-\sqrt{2}\cos\left(\frac{4a}{b}\right)\mathrm{FresnelS}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)-\sqrt{2}\sin\left(\frac{4a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)+4\cos\left(\frac{2a}{b}\right)\mathrm{FresnelS}\right.}{16d}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/16*e^3/d*Pi^(1/2)*(-1/b)^(1/2)*(-2^(1/2)*cos(4*a/b)*FresnelS(2*2^(1/2)/P
i^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2^(1/2)*sin(4*a/b)*Fresne
lC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+4*cos(2*a/b
)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+4*s
in(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^3\left(\int \frac{c^3}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx + \int \frac{d^3x^3}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx + \int \frac{3cd^2x^2}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx + \int \frac{3c^2dx}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(1/2),x)
[Out] e**3*(Integral(c**3/sqrt(a + b*asin(c + d*x)), x) + Integral(d**3*x**3/sqrt
(a + b*asin(c + d*x)), x) + Integral(3*c*d**2*x**2/sqrt(a + b*asin(c + d*x)
), x) + Integral(3*c**2*d*x/sqrt(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^3}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^3/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.74 (sec) , antiderivative size = 318, normalized size of antiderivative = 1.36

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{i\sqrt{\pi}e^3\operatorname{erf}\left(-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}} - \frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{4ia}{b}\right)}}{16\left(\sqrt{2}\sqrt{b}+\frac{i\sqrt{2}b^{\frac{3}{2}}}{|b|}\right)d} + \frac{i\sqrt{\pi}e^3\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}} + \frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{8d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} - \frac{i\sqrt{\pi}e^3\operatorname{erf}\left(-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}} + \frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{4ia}{b}\right)}}{16\left(\sqrt{2}\sqrt{b}-\frac{i\sqrt{2}b^{\frac{3}{2}}}{|b|}\right)d} - \frac{i\sqrt{\pi}e^3\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}} - \frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{8\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/16*I*sqrt(pi)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*sqr
t(b) + I*sqrt(2)*b^(3/2)/abs(b))*d) + 1/8*I*sqrt(pi)*e^3*erf(-sqrt(b*arcsin
(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-
2*I*a/b)/(d*(sqrt(b) - I*b^(3/2)/abs(b))) - 1/16*I*sqrt(pi)*e^3*erf(-sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*sqrt(b) - I*sqrt(2)*b^(3/2)/abs(b
))*d) - 1/8*I*sqrt(pi)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d*(I*b/abs(b)
 + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(1/2),x)
```

```
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(1/2), x)
```

3.261 $\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 243

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} + \frac{e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d}$$

```
[Out] -1/12*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2))*6^(1/2)*Pi^(1/2)/d/b^(1/2)-1/12*e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d/b^(1/2)+1/4*e^2*
cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/
2)*Pi^(1/2)/d/b^(1/2)+1/4*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4889, 12, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{\frac{\pi}{2}}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} - \frac{\sqrt{\frac{\pi}{6}}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} + \frac{\sqrt{\frac{\pi}{2}}e^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} - \frac{\sqrt{\frac{\pi}{6}}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d}$$

```
[In] Int[(c*e + d*e*x)^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/(2*Sqrt[b]*d) - (e^2*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]
*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(2*Sqrt[b]*d) + (e^2*Sqrt[Pi/2]*Fre
snelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(2*Sqrt[b
]*d) - (e^2*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sq
rt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{bd}
\end{aligned}$$

$$= \frac{e^2\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx,x,a+b\arcsin(c+dx)\right)}{bd}$$

$$= -\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd} + \frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd}$$

$$= \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd} - \frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd} - \frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{4bd}$$

$$= \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2bd} - \frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2bd} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2bd} - \frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{2bd}$$

$$= \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} + \frac{e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.02

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{ie^2e^{-\frac{3ia}{b}}\left(3e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-3e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx}{b}\right.\right.}{24d\sqrt{a+}}$$

```
[In] Integrate[(c*e + d*e*x)^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((-1/24*I)*e^2*(3*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Ga
mma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 3*E^(((4*I)*a)/b)*Sqrt[(I*(a +
 b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] + Sqrt[3]
*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin
[c + d*x]))/b]) + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma
[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(d*E^(((3*I)*a)/b)*Sqrt[a + b*A
rcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.09 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.85

method	result
default	$-\frac{e^2\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{3}{b}}\left(\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,b-\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,b+\right.}{12d}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/12*e^2/d*2^(1/2)*Pi^(1/2)*(-3/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b-si
n(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
(-1/b)^(1/2)*(-3/b)^(1/2)*b+cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-
3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^2\left(\int \frac{c^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{d^2x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{2cdx}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(1/2),x)
[Out] e**2*(Integral(c**2/sqrt(a + b*asin(c + d*x)), x) + Integral(d**2*x**2/sqrt
(a + b*asin(c + d*x)), x) + Integral(2*c*d*x/sqrt(a + b*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^2}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^2/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.74 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.42

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d} - \frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}e^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} + \frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2
*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6
)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*d) - 1/4*sqrt(pi)*e^2*erf(-1/2*I*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2
)*sqrt(abs(b)))) - 1/4*sqrt(pi)*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/4*
sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*s
qrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*s
qrt(b) - I*sqrt(6)*b^(3/2)/abs(b))*d)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(1/2), x)
```

3.262 $\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 105

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d} - \frac{e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d}$$

```
[Out] 1/2*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^
(1/2)/d/b^(1/2)-1/2*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2)
)*sin(2*a/b)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {4889, 12, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{\pi}e\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d} - \frac{\sqrt{\pi}e\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d}$$

```
[In] Int[(c*e + d*e*x)/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*
Sqrt[Pi])])/(2*Sqrt[b]*d) - (e*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d
*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(2*Sqrt[b]*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d} \\
&= \frac{e\text{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd} \\
&= -\frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd} \\
&= -\frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2bd} \\
&= \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2bd} \\
&\quad - \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2bd} \\
&= \frac{\left(e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd} \\
&\quad - \frac{\left(e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd} \\
&= \frac{e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d} - \frac{e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.07 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.28

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{4\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[(c*e + d*e*x)/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] -1/4*(e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-2*I)*(a + b*A
rcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)*a)/b)*S
qrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.91

method	result	size
default	$-\frac{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,e\left(\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)+\sin\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)\right)}{2d}$	96

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*Pi^(1/2)*(-1/b)^(1/2)*e*(cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/
(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e\left(\int \frac{c}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx + \int \frac{dx}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(1/2),x)
[Out] e*(Integral(c/sqrt(a + b*asin(c + d*x)), x) + Integral(d*x/sqrt(a + b*asin(
c + d*x)), x))
```

Maxima [F]

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{dex+ce}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.70 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.35

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{i\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\,d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} - \frac{i\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] 1/4*I*sqrt(pi)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin
(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d*(sqrt(b) - I*b^(3/2)/abs(b))
) - 1/4*I*sqrt(pi)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*ar
csin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d*(I*b/abs(b) + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce + dex}{\sqrt{a + b \arcsin(c + dx)}}\,dx = \int \frac{c\,e + d\,e\,x}{\sqrt{a + b\,\mathrm{asin}\,(c + d\,x)}}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(1/2),x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(1/2), x)
```

3.263 $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 105

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

```
[Out] cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/
2)*Pi^(1/2)/d/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4887, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d}$$

```
[In] Int[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]])/(Sqrt[b]*d) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
d*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{d}$$
$$= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{bd}$$
$$= \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{bd}$$
$$= \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.25

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Integrate[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

```
[Out] ((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*Ar
cSin[c + d*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d*E^((I*a)/b)*Sqrt[a + b*ArcSin
[c + d*x]])
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.90

method	result	size
default	$\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\right)}{d}$	94

```
[In] int(1/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^
(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{b\arcsin\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*arcsin(d*x + c) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.39 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.59

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2
)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt
(abs(b))))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(1/2),x)
```

```
[Out] int(1/(a + b*asin(c + d*x))^(1/2), x)
```

3.264 $\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\operatorname{Int}\left(\frac{1}{(c+dx)\sqrt{a+b\arcsin(c+dx)}},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*Sqrt[a + b*ArcSin[x]]), x], x, c + d*x]/(d*e)
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\operatorname{Subst}\left(\int \frac{1}{ex\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{d} \\ &= \frac{\operatorname{Subst}\left(\int \frac{1}{x\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{de} \end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]),x]
[Out] Integrate[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.56 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\sqrt{a+b\arcsin(dx+c)}}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 0.74 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.44

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\frac{\int \frac{1}{c\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(1/2),x)
[Out] Integral(1/(c*sqrt(a + b*asin(c + d*x)) + d*x*sqrt(a + b*asin(c + d*x))), x
)/e
```

Maxima [N/A]

Not integrable

Time = 0.97 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(dex+ce)\sqrt{b\arcsin\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(1/((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(dex+ce)\sqrt{b\arcsin\left(dx+c\right)+a}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2)),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2)), x)
```

3.265 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 412

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = &-\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}\\
&-\frac{e^4\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2b^{3/2}d}\\
&+\frac{3e^4\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d}\\
&-\frac{e^4\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d}\\
&+\frac{e^4\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}d}\\
&-\frac{3e^4\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}d}\\
&+\frac{e^4\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}d}\end{aligned}$$

```
[Out] -1/4*e^4*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/4*e^4*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+3/8*e^4*cos(3*
a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*P
```

```
i^(1/2)/b^(3/2)/d-3/8*e^4*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/d-1/8*e^4*cos(5*a/b)*Fresne
lS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2)/b
^(3/2)/d+1/8*e^4*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/b^(3/2)/d-2*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1
/2)/b/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4889, 12, 4727, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\sqrt{\frac{\pi}{2}}e^4\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2b^{3/2}d} - \frac{3\sqrt{\frac{3\pi}{2}}e^4\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} + \frac{\sqrt{\frac{5\pi}{2}}e^4\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} - \frac{\sqrt{\frac{\pi}{2}}e^4\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2b^{3/2}d} + \frac{3\sqrt{\frac{3\pi}{2}}e^4\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} - \frac{\sqrt{\frac{5\pi}{2}}e^4\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} - \frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (-2*e^4*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]
) - (e^4*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]])/(2*b^(3/2)*d) + (3*e^4*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(
Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(4*b^(3/2)*d) - (e^4*Sqrt
[(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/(4*b^(3/2)*d) + (e^4*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(2*b^(3/2)*d) - (3*e^4*Sqrt[(3*Pi)/2]*F
resnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(4*
b^(3/2)*d) + (e^4*Sqrt[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c
+ d*x]])/Sqrt[b]]*Sin[(5*a)/b])/(4*b^(3/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
```

```
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^4x^4}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{e^4\text{Subst}\left(\int \frac{x^4}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{(2e^4)\,\text{Subst}\left(\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}} - \frac{9\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{e^4\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4b^2d} + \frac{(5e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d} - \frac{(9e^4)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d}$$

$$= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4b^2d} + \frac{\left(9e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d} - \frac{\left(5e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d} + \frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{4b^2d} - \frac{\left(9e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d} + \frac{\left(5e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{8b^2d}$$

$$= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(e^4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2b^2d} + \frac{\left(9e^4\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4b^2d} - \frac{\left(5e^4\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{5x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4b^2d} + \frac{\left(e^4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{2b^2d} - \frac{\left(9e^4\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4b^2d} + \frac{\left(5e^4\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{5x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{4b^2d}$$

$$= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^4\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2b^{3/2}d} + \frac{3e^4\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} - \frac{e^4\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} + \frac{e^4\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}d} - \frac{3e^4\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}d} + \frac{e^4\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.82 (sec) , antiderivative size = 572, normalized size of antiderivative = 1.39

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^4e^{-\frac{5i(a+b\arcsin(c+dx))}{b}}\left(-e^{\frac{5ia}{b}}+3e^{\frac{5ia}{b}+2i\arcsin(c+dx)}-2e^{\frac{5ia}{b}+4i\arcsin(c+dx)}-2e^{\frac{5ia}{b}+\cdots}\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (e^4*(-E^(((5*I)*a)/b) + 3*E^(((5*I)*a)/b + (2*I)*ArcSin[c + d*x]) - 2*E^((
(5*I)*a)/b + (4*I)*ArcSin[c + d*x]) - 2*E^(((5*I)*a)/b + (6*I)*ArcSin[c + d
*x]) + 3*E^(((5*I)*a)/b + (8*I)*ArcSin[c + d*x]) - E^(((5*I)*(a + 2*b*ArcSi
n[c + d*x]))/b) + 2*E^(((4*I)*a)/b + (5*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a +
 b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 2*E^
(((6*I)*a)/b + (5*I)*ArcSin[c + d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] - 3*Sqrt[3]*E^(((2*I)*a)/b + (5*I)
*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*I)
*(a + b*ArcSin[c + d*x]))/b] - 3*Sqrt[3]*E^(((8*I)*a)/b + (5*I)*ArcSin[c +
d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c
 + d*x]))/b] + Sqrt[5]*E^((5*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c
 + d*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c + d*x]))/b] + Sqrt[5]*E^(((
5*I)*(2*a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[1/2, ((5*I)*(a + b*ArcSin[c + d*x]))/b]))/(16*b*d*E^(((5*I)*(a + b*ArcSin
[c + d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.53 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.17

method	result
default	$-\frac{e^4\left(-2\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}-2\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+\cdots}}{\sqrt{\cdots}}\right.\right.}{}$

```
[In] int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*e^4/d/b*(-2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-
2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+3*cos(3*a/b)*Fr
esnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)
*Pi^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+3*sin(3*a/b)*FresnelC(3*2^
(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(
```

```
-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)-cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2
)/(-5/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-5/b)^(1/2)*Pi^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)-sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-5/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)+2*cos(-(a+b*arcsin(d*x+c))/b+a/b)-3*cos(-3*(a+b*arcsin(d*x+c))/
b+3*a/b)+cos(-5*(a+b*arcsin(d*x+c))/b+5*a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^4\left(\int \frac{c^4}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^4x^4}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4cd^3x^3}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4c^3dx}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] e**4*(Integral(c**4/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*
x))*asin(c + d*x)), x) + Integral(d**4*x**4/(a*sqrt(a + b*asin(c + d*x)) +
b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(4*c*d**3*x**3/(a*
sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x)
+ Integral(6*c**2*d**2*x**2/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asi
n(c + d*x))*asin(c + d*x)), x) + Integral(4*c**3*d*x/(a*sqrt(a + b*asin(c +
 d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce + dex)^4}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{(dex + ce)^4}{(b \arcsin(dx + c) + a)^{\frac{3}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{(ce + dex)^4}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{(dex + ce)^4}{(b \arcsin(dx + c) + a)^{\frac{3}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce + dex)^4}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{(c\, e + d\, e\, x)^4}{(a + b \operatorname{asin}(c + d\, x))^{3/2}} \, dx$$

```
[In] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(3/2), x)
```

3.266 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 270

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d} - \frac{e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}d}$$

```
[Out] -1/2*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d-1/2*e^3*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+e^3*co
s(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^
(3/2)/d+e^3*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/
b)*Pi^(1/2)/b^(3/2)/d-2*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d
*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4889, 12, 4727, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{\sqrt{\frac{\pi}{2}}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{\sqrt{\pi}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d} + \frac{\sqrt{\pi}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d} - \frac{\sqrt{\frac{\pi}{2}}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (-2*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]
) - (e^3*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]])/(b^(3/2)*d) + (e^3*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(b^(3/2)*d) + (e^3*Sqrt[Pi]
*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])
/(b^(3/2)*d) - (e^3*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
 d*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d} \\
&= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} \\
&\quad + \frac{(2e^3)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{2\sqrt{x}}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{b^2d}
\end{aligned}
$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} + \frac{e^3\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} - \frac{\left(e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} + \frac{\left(e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} - \frac{\left(e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(2e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} - \frac{\left(2e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} + \frac{\left(2e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} - \frac{\left(2e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d} - \frac{e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.11

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx =$$

$$-\frac{ie^3e^{-\frac{4ia}{b}}\left(\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(c}{b}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] ((-1/4*I)*e^3*(Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/
b]*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - Sqrt[2]*E^(((6*I)*a)/b)
*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*
x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*
ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b] - (2*I)*E^(((4*I)*a)/b)*Sin[2
*ArcSin[c + d*x]] + I*E^(((4*I)*a)/b)*Sin[4*ArcSin[c + d*x]]))/(b*d*E^(((4*
I)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.22

method	result
default	$\frac{e^3\left(-2\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\sqrt{\pi}\sqrt{a+b\arcsin(dx+c)}\sqrt{-\frac{1}{b}}+2\sin\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{\right.}{}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*e^3/d/b*(-2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*(-1/b)^(1/
2)+2*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*(-1/b)^(1/2)+4*(-1/b)
^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^
(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-4*(-1/b)^(1/2)*Pi^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b)+2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)-sin(-4*(
a+b*arcsin(d*x+c))/b+4*a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^3\left(\int \frac{c^3}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^3x^3}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{3cd^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{3c^2dx}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(3/2),x)
```

```
[Out] e**3*(Integral(c**3/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*
x))*asin(c + d*x)), x) + Integral(d**3*x**3/(a*sqrt(a + b*asin(c + d*x)) +
b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(3*c*d**2*x**2/(a*
sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x)
+ Integral(3*c**2*d*x/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c +
d*x))*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(3/2), x)
```

3.267 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 280

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx &= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} \\ &\quad - \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} \\ &\quad + \frac{e^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} \\ &\quad + \frac{e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d} \\ &\quad - \frac{e^2\sqrt{\frac{3\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}d}\end{aligned}$$

```
[Out] -1/2*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/2*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/2*e^2*cos(3*
a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*P
i^(1/2)/b^(3/2)/d-1/2*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/d-2*e^2*(d*x+c)^2*(1-(d*x+c
)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4889, 12, 4727, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\sqrt{\frac{\pi}{2}}e^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{\sqrt{\frac{3\pi}{2}}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{\sqrt{\frac{\pi}{2}}e^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{\sqrt{\frac{3\pi}{2}}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (-2*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]
) - (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]])/(b^(3/2)*d) + (e^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt
[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(b^(3/2)*d) + (e^2*Sqrt[Pi/2]
*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(b^(3
/2)*d) - (e^2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}\\
&\quad+\frac{(2e^2)\,\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}
\end{aligned}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d} - \frac{(3e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d} + \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d} - \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{2b^2d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} + \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} - \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d} - \frac{e^2\sqrt{\frac{3\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.45 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.36

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^2e^{-\frac{3i(a+b\arcsin(c+dx))}{b}}\left(e^{\frac{3ia}{b}}-e^{\frac{3ia}{b}+2i\arcsin(c+dx)}-e^{\frac{3ia}{b}+4i\arcsin(c+dx)}+e^{\frac{3i(a+2b\arcs}{b}}\right.}{}$$

[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(3/2),x]

[Out] (e^2*(E^(((3*I)*a)/b) - E^(((3*I)*a)/b + (2*I)*ArcSin[c + d*x]) - E^(((3*I)*a)/b + (4*I)*ArcSin[c + d*x]) + E^(((3*I)*(a + 2*b*ArcSin[c + d*x]))/b) + E^(((2*I)*a)/b + (3*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b + (3*I)*ArcSin[c + d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] - Sqrt[3]*E^((3*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c + d*x]))/b] - Sqrt[3]*E^((3*I)*((2*a)/b + ArcSin[c + d*x]))*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b]))/(4*b*d*E^(((3*I)*(a + b*ArcSin[c + d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])

Maple [A] (verified)

Time = 1.30 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.16

method	result
default	$-\frac{e^2\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.\right.}{}$

[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/2*e^2/d/b*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+cos(-(a+b*arcsin(d*x+c))/b+a/b)-cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b))/(a+b*arcsin(d*x+c))^(1/2)

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^2\left(\int \frac{c^2}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx + \int \frac{d^2x^2}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx + \int \frac{2cdx}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx\right)$$

[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(3/2),x)

[Out] e**2*(Integral(c**2/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(d**2*x**2/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(2*c*d*x/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x))

Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")

[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(3/2), x)

Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(3/2), x)
```

3.268 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 144

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx=-\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}+\frac{2e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d}+\frac{2e\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d}$$

```
[Out] 2*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1
/2)/b^(3/2)/d+2*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*si
n(2*a/b)*Pi^(1/2)/b^(3/2)/d-2*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin
(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4889, 12, 4727, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx=\frac{2\sqrt{\pi}e\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d}+\frac{2\sqrt{\pi}e\sin\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d}-\frac{2e\sqrt{1-(c+dx)^2}(c+dx)}{bd\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] (-2*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]) +
(2*e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b
]*Sqrt[Pi])])/(b^(3/2)*d) + (2*e*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c +
 d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(b^(3/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}+\frac{(2e)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}\\
&\quad+\frac{\left(2e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{b^2d}\\
&\quad+\frac{\left(2e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{b^2d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}\\
&\quad+\frac{\left(4e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}\\
&\quad+\frac{\left(4e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}+\frac{2e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d}\\
&\quad+\frac{2e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.17

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{iee^{-\frac{2ia}{b}}\left(-\sqrt{2}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+\sqrt{2}e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b}{}}\right.}{2bd\sqrt{a+b\arcsin(}}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(3/2),x]
```

```
[Out] ((I/2)*e*(-(Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-2*
I)*(a + b*ArcSin[c + d*x]))/b]) + Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*Ar
cSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b] + (2*I)*E^
(((2*I)*a)/b)*Sin[2*ArcSin[c + d*x]]))/(b*d*E^(((2*I)*a)/b)*Sqrt[a + b*ArcS
in[c + d*x]])
```

Maple [A] (verified)

Time = 0.88 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.17

method	result
default	$\frac{e\left(2\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{2}{b}}\,b}\right)-2\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(2\sqrt{}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] e/d/b*(2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fresnel
C(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2*(-1/b)^(1/
2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(-2*(a+b*arcsin(d*x+c))/b+2*
a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = e\left(\int \frac{c}{a\sqrt{a + b \operatorname{asin}(c + dx)} + b\sqrt{a + b \operatorname{asin}(c + dx)} \operatorname{asin}(c + dx)} \, dx + \int \frac{dx}{a\sqrt{a + b \operatorname{asin}(c + dx)} + b\sqrt{a + b \operatorname{asin}(c + dx)} \operatorname{asin}(c + dx)} \, dx\right)$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(3/2),x)
[Out] e*(Integral(c/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*as
in(c + d*x)), x) + Integral(d*x/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b
*asin(c + d*x))*asin(c + d*x)), x))
```

Maxima [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{dex + ce}{(b \arcsin(dx + c) + a)^{\frac{3}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{dex + ce}{(b \arcsin(dx + c) + a)^{\frac{3}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{c\,e + d\,e\,x}{(a + b \operatorname{asin}(c + d\,x))^{3/2}} \, dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(3/2),x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(3/2), x)
```

3.269 $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 144

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{2\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}$$

```
[Out] -2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^
(1/2)*Pi^(1/2)/b^(3/2)/d+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d-2*(1-(d*x+c)^2)^(1/2)/b/d/
(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4887, 4717, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{2\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} - \frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

```
[Out] (-2*Sqrt[1 - (c + d*x)^2])/(b*d*Sqrt[a + b*ArcSin[c + d*x]]) - (2*Sqrt[2*Pi
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(b^(
3/2)*d) + (2*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/S
qrt[b]]*Sin[a/b])/(b^(3/2)*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
```

```
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{bd}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} + \frac{2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^2d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d} + \frac{\left(4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^2d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.28

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(e^{i\arcsin(c+dx)}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)\right.}{bd\sqrt{a}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

```
[Out] (E^(I*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((
-I)*(a + b*ArcSin[c + d*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c + d*x
]) + E^((I*(a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(b*d*E^((I*(a + b*ArcSin[c + d*
x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.18

method	result
default	$-\frac{2\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$

```
[In] int(1/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/d/b*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-(a+b*arc
sin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(-(a+b*arcsin(d*x+c))/
b+a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(3/2),x)
[Out] Integral((a + b*asin(c + d*x))**(-3/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(3/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(3/2), x)
```

3.270 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{3/2}},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(3/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^(3/2)), x], x, c + d*x]/(d*e
)
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{d}\\ &= \frac{\text{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.97 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{\frac{3}{2}}}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 1.97 (sec) , antiderivative size = 88, normalized size of antiderivative = 3.52

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\int \frac{1}{ac\sqrt{a+b\operatorname{asin}(c+dx)}+adx\sqrt{a+b\operatorname{asin}(c+dx)}+bc\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+bdx\sqrt{}}}{e}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(3/2),x)
[Out] Integral(1/(a*c*sqrt(a + b*asin(c + d*x)) + a*d*x*sqrt(a + b*asin(c + d*x))
 + b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b*d*x*sqrt(a + b*asin(c +
d*x))*asin(c + d*x)), x)/e
```

Maxima [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2)), x)
```

Giac [N/A]

Not integrable

Time = 2.56 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{3/2}}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2)),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2)), x)
```

3.271 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 344

$$\begin{aligned}
\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} \\
&- \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&+ \frac{4e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} \\
&- \frac{4e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} \\
&+ \frac{4e^3\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d} \\
&- \frac{4e^3\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{3b^{5/2}d}
\end{aligned}$$

```
[Out] -4/3*e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*
Pi^(1/2)/b^(5/2)/d+4/3*e^3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^
(1/2))*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d+4/3*e^3*cos(4*a/b)*FresnelS(2*2^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d-4/3*
e^3*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/
b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+
b*arcsin(d*x+c))^(3/2)-4*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^(1/2)+16/3
*e^3*(d*x+c)^4/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{4\sqrt{\pi}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{4\sqrt{2\pi}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{\pi}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{2e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{3bd(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-2*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(3*b*d*(a + b*ArcSin[c + d*x])^(
3/2)) - (4*e^3*(c + d*x)^2)/(b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) + (16*e^3*(
c + d*x)^4)/(3*b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) + (4*e^3*Sqrt[2*Pi]*Cos[(
4*a)/b]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(3*b^
(5/2)*d) - (4*e^3*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d
*x]])/(Sqrt[b]*Sqrt[Pi])])/(3*b^(5/2)*d) + (4*e^3*Sqrt[Pi]*FresnelC[(2*Sqrt
[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(3*b^(5/2)*d) -
(4*e^3*Sqrt[2*Pi]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[
b]]*Sin[(4*a)/b])/(3*b^(5/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
```

```
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}+\frac{(2e^3)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{bd}\\
&\quad-\frac{(8e^3)\,\text{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd}\\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}-\frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}}+\frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad+\frac{(8e^3)\,\text{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{b^2d}-\frac{(64e^3)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d}\\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}\\
&\quad-\frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}}+\frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad-\frac{(8e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}\\
&\quad+\frac{(64e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}
\end{aligned}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{(8e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{(64e^3)\,\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}} + \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4\sqrt{x}}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{(8e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} - \frac{(4e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{(16e^3)\,\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(4e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{\left(16e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} + \frac{\left(8e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} - \frac{\left(4e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(16e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} - \frac{\left(8e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{\left(8e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d} - \frac{\left(32e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} + \frac{\left(16e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} - \frac{\left(8e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d} + \frac{\left(32e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} - \frac{\left(16e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} + \frac{4e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d} - \frac{4e^3\sqrt{2\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{3b^{5/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.22 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.02

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^3\left(-4(a+b\arcsin(c+dx))\left(e^{-2i\arcsin(c+dx)}+e^{2i\arcsin(c+dx)}-\sqrt{2}e^{-\frac{2ia}{b}}\sqrt{-\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (e^3*(-4*(a + b*ArcSin[c + d*x])*(E^((-2*I)*ArcSin[c + d*x]) + E^((2*I)*Arc
Sin[c + d*x]) - (Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2,
((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) - Sqrt[2]*E^(((2*I)*a)
/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c +
 d*x]))/b]) + 4*(a + b*ArcSin[c + d*x])*(E^((-4*I)*ArcSin[c + d*x]) + E^((4
*I)*ArcSin[c + d*x]) - (2*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2,
 ((-4*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((4*I)*a)/b) - 2*E^(((4*I)*a)/b)*S
qrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]
))/b]) - 2*b*Sin[2*ArcSin[c + d*x]] + b*Sin[4*ArcSin[c + d*x]]))/(12*b^2*d*
(a + b*ArcSin[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 732 vs. 2(284) = 568.

Time = 1.30 (sec) , antiderivative size = 733, normalized size of antiderivative = 2.13

method	result
default	$\frac{e^3\left(-16\cos\left(\frac{4a}{b}\right)\mathrm{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\arcsin(dx+c)b-16\sin\left(\frac{4a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.\right.}{}$

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*e^3/d/b^2*(-16*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)*arcsin(d*x+c)*b-16*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/
2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)*arcsin(d*x+c)*b+16*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b)*b+16*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*b-16*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin
```

```
(d*x+c))^(1/2)*a-16*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)*a+16*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fres
nelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+16*(-1/
b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/P
i^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a-8*arcsin(d*x+c)*cos(-2*
(a+b*arcsin(d*x+c))/b+2*a/b)*b+8*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*arcsin
(d*x+c)*b+2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b-8*cos(-2*(a+b*arcsin(d*x+
c))/b+2*a/b)*a-sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b+8*cos(-4*(a+b*arcsin(d
*x+c))/b+4*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e^3\left(\int \frac{c^3}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b\right.$$
$$+\int \frac{d^3x^3}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$
$$+\int \frac{3cd^2x^2}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$
$$+\int \frac{3c^2dx}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] e**3*(Integral(c**3/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin
(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2)
, x) + Integral(d**3*x**3/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a +
b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*
x)**2), x) + Integral(3*c*d**2*x**2/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b
*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*a
```

```
sin(c + d*x)**2), x) + Integral(3*c**2*d*x/(a**2*sqrt(a + b*asin(c + d*x))
+ 2*a*b*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c +
d*x))*asin(c + d*x)**2), x))
```

Maxima [F]

$$\int \frac{(ce + dex)^3}{(a + b\arcsin(c + dx))^{5/2}} \, dx = \int \frac{(dex + ce)^3}{(b\arcsin(dx + c) + a)^{\frac{5}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{(ce + dex)^3}{(a + b\arcsin(c + dx))^{5/2}} \, dx = \int \frac{(dex + ce)^3}{(b\arcsin(dx + c) + a)^{\frac{5}{2}}} \, dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce + dex)^3}{(a + b\arcsin(c + dx))^{5/2}} \, dx = \int \frac{(c\,e + d\,e\,x)^3}{(a + b\,\mathrm{asin}\,(c + d\,x))^{5/2}} \, dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(5/2), x)
```

3.272 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 342

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} \\ &+ \frac{e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{5/2}d} \\ &- \frac{e^2\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d} \\ &+ \frac{e^2\sqrt{6\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{5/2}d}\end{aligned}$$

```
[Out] -1/3*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d-1/3*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d+e^2*cos(3*a/b)
*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1
/2)/b^(5/2)/d+e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(
1/2)/b/d/(a+b*arcsin(d*x+c))^(3/2)-8/3*e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c)
)^(1/2)+4*e^2*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.480$, Rules used = {4889, 12, 4729, 4807, 4731, 4491, 3387, 3386, 3432, 3385, 3433, 4719}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{\sqrt{2\pi}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{\sqrt{6\pi}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{5/2}d} - \frac{\sqrt{2\pi}e^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{\sqrt{6\pi}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{5/2}d} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{2e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{3bd(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-2*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(3*b*d*(a + b*ArcSin[c + d*x])^(
3/2)) - (8*e^2*(c + d*x))/(3*b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) + (4*e^2*(c
 + d*x)^3)/(b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) - (e^2*Sqrt[2*Pi]*Cos[a/b]*F
resnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(3*b^(5/2)*d) +
(e^2*Sqrt[6*Pi]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]])/(b^(5/2)*d) - (e^2*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b
*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(3*b^(5/2)*d) + (e^2*Sqrt[6*Pi]*Fresn
elS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(5/2
)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
```

```
b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^2x^2}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d} \\
&= \frac{e^2\text{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{(4e^2)\,\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd} \\
&\quad - \frac{(2e^2)\,\text{Subst}\left(\int \frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{bd} \\
&= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad + \frac{(8e^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d} - \frac{(12e^2)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{b^2d} \\
&= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{(8e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} \\
&\quad - \frac{(12e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{b^3d}
\end{aligned}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{(12e^2)\,\text{Subst}\left(\int\left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(8e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} + \frac{\left(8e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{(3e^2)\,\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{(3e^2)\,\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(16e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} + \frac{\left(16e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{8e^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d} - \frac{\left(3e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d} - \frac{\left(3e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d} + \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{b^3d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{8e^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d} - \frac{\left(6e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d} + \frac{\left(6e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d} - \frac{\left(6e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d} + \frac{\left(6e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{b^3d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{5/2}d} - \frac{e^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d} + \frac{e^2\sqrt{6\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{5/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.06 (sec) , antiderivative size = 411, normalized size of antiderivative = 1.20

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^2\left(-6iae^{-3i\arcsin(c+dx)} + be^{-3i\arcsin(c+dx)}(1-6i\arcsin(c+dx)) + e^{3i\arcsin(}\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (e^2*(((-6*I)*a)/E^((3*I)*ArcSin[c + d*x]) + (b*(1 - (6*I)*ArcSin[c + d*x])
)/E^((3*I)*ArcSin[c + d*x]) + E^((3*I)*ArcSin[c + d*x])*((6*I)*a + b + (6*I
)*b*ArcSin[c + d*x]) - I*E^(I*ArcSin[c + d*x])*(2*a - I*b + 2*b*ArcSin[c +
d*x]) - (2*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*(a +
 b*ArcSin[c + d*x]))/b])/E^((I*a)/b) + (I*(2*a + I*b + 2*b*ArcSin[c + d*x]
+ (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x]))/b)
^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/E^(I*ArcSin[c + d*x]) +
(6*Sqrt[3]*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-3*I)*(a
 + b*ArcSin[c + d*x]))/b])/E^(((3*I)*a)/b) + 6*Sqrt[3]*b*E^(((3*I)*a)/b)*((
I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x
]))/b]))/(12*b^2*d*(a + b*ArcSin[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 732 vs. 2(286) = 572.

Time = 1.18 (sec) , antiderivative size = 733, normalized size of antiderivative = 2.14

method	result
default	$-\frac{e^2\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c}}{}$

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*e^2/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*
cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
)*(-1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)
*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*(-1/b)^(1/2)*b-6*2^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)
/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*arcsin(d*x+c)*(a+b*
arcsin(d*x+c))^(1/2)*b+6*2^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^
(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*arcsin(d*x+c)*
(a+b*arcsin(d*x+c))^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*co
s(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
(-1/b)^(1/2)*a-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*Fresne
lS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*
a-6*2^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a+6*2^(1/
2)*Pi^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a+2*arcsin(d*x+c)*
sin(-(a+b*arcsin(d*x+c))/b+a/b)*b-6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(d*x+c)
)/b+3*a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+b*arcsin(d*x+c))/b
+a/b)*a-cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b-6*sin(-3*(a+b*arcsin(d*x+c))/
b+3*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e^2\left(\int \frac{c^2}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b\right.$$
$$+\int \frac{d^2x^2}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}$$
$$+\int \frac{2cdx}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] e**2*(Integral(c**2/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin
(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2)
, x) + Integral(d**2*x**2/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a +
b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*
x)**2), x) + Integral(2*c*d*x/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(
a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c
+ d*x)**2), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce + dex)^2}{(a + b\arcsin(c + dx))^{5/2}}\,dx = \int \frac{\left(c\,e + d\,e\,x\right)^2}{\left(a + b\,\mathrm{asin}\left(c + d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(5/2), x)
```

3.273 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 207

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{8e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} + \frac{8e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d}$$

```
[Out] -8/3*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi
^(1/2)/b^(5/2)/d+8/3*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2
))*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d-2/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b
*arcsin(d*x+c))^(3/2)-4/3*e/b^2/d/(a+b*arcsin(d*x+c))^(1/2)+8/3*e*(d*x+c)^2
/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules

used = {4889, 12, 4729, 4807, 4731, 4491, 3387, 3386, 3432, 3385, 3433, 4737}

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{8\sqrt{\pi}e\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} - \frac{8\sqrt{\pi}e\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{2e\sqrt{1-(c+dx)^2}(c+dx)}{3bd(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] (-2*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(3*b*d*(a + b*ArcSin[c + d*x])^(3/2)
) - (4*e)/(3*b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) + (8*e*(c + d*x)^2)/(3*b^2*
d*Sqrt[a + b*ArcSin[c + d*x]]) - (8*e*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqr
t[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(3*b^(5/2)*d) + (8*e*Sqrt[Pi
]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]
)/(3*b^(5/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{(2e)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd}\\
&\quad - \frac{(4e)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{(16e)\text{Subst}\left(\int \frac{x}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{(16e)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{(16e)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{(8e)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}
\end{aligned}$$

$$= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(8e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{3b^3d} + \frac{\left(8e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}$$

$$= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(16e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} + \frac{\left(16e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d}$$

$$= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{8e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} + \frac{8e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.22 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.93

$$\int\frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}dx = -\frac{e\left(2(a+b\arcsin(c+dx))\left(e^{-2i\arcsin(c+dx)}+e^{2i\arcsin(c+dx)}-\sqrt{2}e^{-\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin}{b}\right.\right.\right.}{3b^2d(a+b\arcsin(c+da}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(5/2),x]
```

```
[Out] -1/3*(e*(2*(a + b*ArcSin[c + d*x])*(E^((-2*I)*ArcSin[c + d*x]) + E^((2*I)*A
rcSin[c + d*x]) - (Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2
, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) - Sqrt[2]*E^(((2*I)*
a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c
 + d*x]))/b]) + b*Sin[2*ArcSin[c + d*x]]))/(b^2*d*(a + b*ArcSin[c + d*x])^(
3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. 2(169) = 338.

Time = 0.98 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.79

method	result
default	$\frac{e\left(8\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b+8\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(a}\right.}{}$

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*e/d/b^2*(8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)/b)*b+8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*s
in(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b)*b+8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fresnel
S(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+8*(-1/b)^(
1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1
/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a-4*arcsin(d*x+c)*cos(-2*(a+b
*arcsin(d*x+c))/b+2*a/b)*b+sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b-4*cos(-2*(
a+b*arcsin(d*x+c))/b+2*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e\left(\int \frac{c}{a^2\sqrt{a+b\,\text{asin}\,(c+dx)}+2ab\sqrt{a+b\,\text{asin}\,(c+dx)}\,\text{asin}\,(c+dx)+b^2\sqrt{}}\right.$$
$$+\int \frac{dx}{a^2\sqrt{a+b\,\text{asin}\,(c+dx)}+2ab\sqrt{a+b\,\text{asin}\,(c+dx)}\,\text{asin}\,(c+dx)+b^2\sqrt{a+b\,\text{asin}\,(c+dx)}\,\text{asin}^2\,(c+dx)}\,d$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] e*(Integral(c/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin(c + d
*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2), x) +
 Integral(d*x/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin(c + d
*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2), x))
```

Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{dex+ce}{(b\arcsin\left(dx+c\right)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Giac [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{dex+ce}{(b\arcsin\left(dx+c\right)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{c\,e+d\,e\,x}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(5/2),x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(5/2), x)
```

3.274 $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 179

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}$$

```
[Out] -4/3*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*
2^(1/2)*Pi^(1/2)/b^(5/2)/d-4/3*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*(1-(d*x+c)^2)^(1/2
)/b/d/(a+b*arcsin(d*x+c))^(3/2)+4/3*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$, Rules used

$= \{4887, 4717, 4807, 4719, 3387, 3386, 3432, 3385, 3433\}$

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

```
[Out] (-2*Sqrt[1 - (c + d*x)^2])/(3*b*d*(a + b*ArcSin[c + d*x])^(3/2)) + (4*(c +
d*x))/(3*b^2*d*Sqrt[a + b*ArcSin[c + d*x]]) - (4*Sqrt[2*Pi]*Cos[a/b]*Fresne
lC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(3*b^(5/2)*d) - (4*Sq
rt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b
])/(3*b^(5/2)*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{3bd}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad - \frac{4\text{Subst}\left(\int \frac{1}{\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{3b^2d}\\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad - \frac{4\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{3b^3d}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}+\frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad -\frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{3b^3d} \\
&\quad -\frac{\left(4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{3b^3d} \\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}+\frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad -\frac{\left(8\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} \\
&\quad -\frac{\left(8\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{3b^3d} \\
&= -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}+\frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\
&\quad -\frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} \\
&\quad -\frac{4\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.33

$$
\int\frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx=\frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(-2be^{i\arcsin(c+dx)}\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{3/2}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right.\right.}{}
$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

```
[Out] (-2*b*E^(I*ArcSin[c + d*x])*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[
1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - I*E^((I*a)/b)*(2*a*(-1 + E^((2*I)*
ArcSin[c + d*x])) + b*(-I - 2*ArcSin[c + d*x] + E^((2*I)*ArcSin[c + d*x])*(
-I + 2*ArcSin[c + d*x])) - (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((I*(a
 + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))
/(3*b^2*d*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^(3/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. 2(145) = 290.

Time = 0.31 (sec) , antiderivative size = 370, normalized size of antiderivative = 2.07

method	result
default	$-\frac{2\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\right.}{}$

```
[In] int(1/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-
1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin
(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(
-1/b)^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(a/b)*Fresnel
C(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a
-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a+2*arcsin(d*x
+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*s
in(-(a+b*arcsin(d*x+c))/b+a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-5/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(5/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(5/2), x)
```

3.275 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx=\frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{5/2}},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(5/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)),x]
```

```
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^(5/2)), x], x, c + d*x]/(d*e
)
```

Rubi steps

$$\text{integral}=\frac{\operatorname{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{d}$$

$$=\frac{\operatorname{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{de}$$

Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.07 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{\frac{5}{2}}}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 8.53 (sec) , antiderivative size = 155, normalized size of antiderivative = 6.20

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx=\frac{\int \frac{1}{a^2c\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+a^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2abc\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(5/2),x)
[Out] Integral(1/(a**2*c*sqrt(a + b*asin(c + d*x)) + a**2*d*x*sqrt(a + b*asin(c +
 d*x)) + 2*a*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 2*a*b*d*x*sqrt(a
 + b*asin(c + d*x))*asin(c + d*x) + b**2*c*sqrt(a + b*asin(c + d*x))*asin(c
 + d*x)**2 + b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2), x)/e
```

Maxima [N/A]

Not integrable

Time = 1.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2)), x)
```

Giac [N/A]

Not integrable

Time = 5.95 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{5/2}}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2)),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2)), x)
```

3.276 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 442

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{32e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{16e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} - \frac{16e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d} + \frac{32e^3\sqrt{2\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{15b^{7/2}d}$$

```
[Out] -4/5*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+16/15*e^3*(d*x+c)^4/b^2/
d/(a+b*arcsin(d*x+c))^(3/2)-16/15*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x
+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(7/2)/d-16/15*e^3*FresnelS(2*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(7/2)/d+32/15*e
^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
)*2^(1/2)*Pi^(1/2)/b^(7/2)/d+32/15*e^3*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/5*e^3*(d
```

```
*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2)-16/5*e^3*(d*x+c)*
(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)+128/15*e^3*(d*x+c)^3*(1
-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 442, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4889, 12, 4729, 4807, 4727, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{32\sqrt{2\pi}e^3\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{16\sqrt{\pi}e^3\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} - \frac{16\sqrt{\pi}e^3\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} + \frac{32\sqrt{2\pi}e^3\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{128e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{16e^3\sqrt{1-(c+dx)^2}(c+dx)}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{2e^3\sqrt{1-(c+dx)^2}(c+dx)^3}{5bd(a+b\arcsin(c+dx))^{5/2}}$$

```
[In] Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-2*e^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(5*b*d*(a + b*ArcSin[c + d*x])^(
5/2)) - (4*e^3*(c + d*x)^2)/(5*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (16*e
^3*(c + d*x)^4)/(15*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) - (16*e^3*(c + d*x
)*Sqrt[1 - (c + d*x)^2])/(5*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) + (128*e^3*(
c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(15*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) +
(32*e^3*Sqrt[2*Pi]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
+ d*x]])/Sqrt[b]])/(15*b^(7/2)*d) - (16*e^3*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(15*b^(7/2)*d) - (16*e
^3*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Si
n[(2*a)/b])/(15*b^(7/2)*d) + (32*e^3*Sqrt[2*Pi]*FresnelS[(2*Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/(15*b^(7/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
```

```
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^3x^3}{(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{d}\\
&= \frac{e^3\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{d}\\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{(6e^3)\,\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{5bd}\\
&\quad -\frac{(8e^3)\,\text{Subst}\left(\int \frac{x^4}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{5bd}\\
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}-\frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}}\\
&\quad +\frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}}+\frac{(8e^3)\,\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{5b^2d}\\
&\quad -\frac{(64e^3)\,\text{Subst}\left(\int \frac{x^3}{(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{15b^2d}
\end{aligned}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{(16e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{5b^4d} - \frac{(128e^3)\,\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{2\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{(64e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d} - \frac{(64e^3)\,\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d} + \frac{\left(16e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{5b^4d} + \frac{\left(16e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{5b^4d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(64e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} + \frac{\left(32e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d} + \frac{\left(64e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} - \frac{\left(64e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} + \frac{\left(32e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d} + \frac{\left(64e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{16e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{5b^{7/2}d} + \frac{16e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{5b^{7/2}d} - \frac{\left(128e^3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} + \frac{\left(128e^3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} - \frac{\left(128e^3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} + \frac{\left(128e^3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d}$$

$$
\begin{aligned}
&= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}} \\
&+ \frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} \\
&+ \frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} \\
&+ \frac{32e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} \\
&- \frac{16e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} \\
&- \frac{16e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d} \\
&+ \frac{32e^3\sqrt{2\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{15b^{7/2}d}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.80 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.01

$$
\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{e^3\left(-4(a+b\arcsin(c+dx))\left(e^{2i\arcsin(c+dx)}(4ia+b+4ib\arcsin(c+dx))\right.\right.}{}
$$

```
[In] Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (e^3*(-4*(a + b*ArcSin[c + d*x])*(E^((2*I)*ArcSin[c + d*x])*((4*I)*a + b +
(4*I)*b*ArcSin[c + d*x]) + (4*Sqrt[2]*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^
(3/2)*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) + ((-
4*I)*a + b - (4*I)*b*ArcSin[c + d*x] + 4*Sqrt[2]*b*E^(((2*I)*(a + b*ArcSin[
c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((2*I)*(a +
b*ArcSin[c + d*x]))/b])/E^((2*I)*ArcSin[c + d*x])) + 4*(a + b*ArcSin[c + d*
x])*(((-8*I)*a + b - (8*I)*b*ArcSin[c + d*x])/E^((4*I)*ArcSin[c + d*x]) + E
^((4*I)*ArcSin[c + d*x])*((8*I)*a + b + (8*I)*b*ArcSin[c + d*x]) + (16*b*((
(-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-4*I)*(a + b*ArcSin[c +
 d*x]))/b])/E^(((4*I)*a)/b) + 16*b*E^(((4*I)*a)/b)*((I*(a + b*ArcSin[c + d*
x]))/b)^(3/2)*Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]) - 6*b^2*Sin[2*
ArcSin[c + d*x]] + 3*b^2*Sin[4*ArcSin[c + d*x]]))/(60*b^3*d*(a + b*ArcSin[c
 + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1246 vs. 2(368) = 736.

Time = 1.34 (sec) , antiderivative size = 1247, normalized size of antiderivative = 2.82

method	result	size
default	Expression too large to display	1247

```
[In] int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*e^3/d/b^3*(-128*(-1/b)^(1/2)*arcsin(d*x+c)^2*cos(4*a/b)*FresnelC(2*2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)*b^2+128*(-1/b)^(1/2)*arcsin(d*x+c)^2*sin(4*a/b)*Fr
esnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)
*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*b^2+64*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^
(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-64*arcsin(d*x+c)^2*(-1/b)^(1/2)*P
i^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-
2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-256*(-1/b)^(1/2)*arcsin(d*x+c)*
cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a*b+256*(-1/b)^(1/2)*arcsi
n(d*x+c)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a*b+128*arcsin(d*
x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*
2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b-128*arcsin(d
*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2
*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b-128*(-1/b)^
(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a^2+128*(-1/b)^(1/2)
*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a^2+64*(-1/b)^(1/2)*Pi^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2-64*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*a^2+32*arcsin(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2
*a/b)*b^2-64*arcsin(d*x+c)^2*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^2+64*arc
sin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+8*arcsin(d*x+c)*cos(-2*(
a+b*arcsin(d*x+c))/b+2*a/b)*b^2-128*arcsin(d*x+c)*sin(-4*(a+b*arcsin(d*x+c)
)/b+4*a/b)*a*b-8*arcsin(d*x+c)*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^2+32*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2-6*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b
)*b^2+8*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b-64*sin(-4*(a+b*arcsin(d*x+c
))/b+4*a/b)*a^2+3*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^2-8*cos(-4*(a+b*arc
sin(d*x+c))/b+4*a/b)*a*b)/(a+b*arcsin(d*x+c))^(5/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e^3\left(\int \frac{}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+}\right.$$
$$+\int \frac{d^3x^3}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+}$$
$$+\int \frac{3cd^2x^2}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+}$$
$$+\int \frac{3c^2dx}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+}$$

```
[In] integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(7/2),x)
[Out] e**3*(Integral(c**3/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*a
sin(c + d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d
*x)**2 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(d*
*3*x**3/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x)
)*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**
3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(3*c*d**2*x**2/
(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c
 + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(a
 + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(3*c**2*d*x/(a**3*sqrt(
a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 3
*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(a + b*asin(c
 + d*x))*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

```
[In] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(7/2),x)
[Out] int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(7/2), x)
```

3.277 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 441

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{2e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{6e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{5b^{7/2}d} - \frac{2e^2\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d} + \frac{6e^2\sqrt{6\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{5b^{7/2}d}$$

```
[Out] -8/15*e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+4/5*e^2*(d*x+c)^3/b^2/d/(
a+b*arcsin(d*x+c))^(3/2)+2/15*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/15*e^2*FresnelC(2
^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2
)/b^(7/2)/d-6/5*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/b^(7/2)/d+6/5*e^2*FresnelC(6^(1/2)/Pi^(1/
```

```
2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(7/2)/d
-2/5*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2)-16/15*
e^2*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)+24/5*e^2*(d*x+c)^2*
(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.480$, Rules used = {4889, 12, 4729, 4807, 4727, 3387, 3386, 3432, 3385, 3433, 4717, 4809}

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2\sqrt{2\pi}e^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{6\sqrt{6\pi}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{5b^{7/2}d} + \frac{2\sqrt{2\pi}e^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{6\sqrt{6\pi}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{5b^{7/2}d} + \frac{24e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{5b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{2e^2\sqrt{1-(c+dx)^2}(c+dx)^2}{5bd(a+b\arcsin(c+dx))^{5/2}}$$

```
[In] Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-2*e^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(5*b*d*(a + b*ArcSin[c + d*x])^(
5/2)) - (8*e^2*(c + d*x))/(15*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (4*e^2
*(c + d*x)^3)/(5*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) - (16*e^2*Sqrt[1 - (c
 + d*x)^2])/(15*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) + (24*e^2*(c + d*x)^2*Sq
rt[1 - (c + d*x)^2])/(5*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) + (2*e^2*Sqrt[2*
Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(1
5*b^(7/2)*d) - (6*e^2*Sqrt[6*Pi]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]])/(5*b^(7/2)*d) - (2*e^2*Sqrt[2*Pi]*FresnelC[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(15*b^(7/2)*d) +
 (6*e^2*Sqrt[6*Pi]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b
]]*Sin[(3*a)/b])/(5*b^(7/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int\frac{e^2x^2}{(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{d}\\&=\frac{e^2\text{Subst}\left(\int\frac{x^2}{(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{d}\\&=-\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{(4e^2)\,\text{Subst}\left(\int\frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{5bd}\\&\quad-\frac{(6e^2)\,\text{Subst}\left(\int\frac{x^3}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx,x,c+dx\right)}{5bd}\end{aligned}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{(8e^2)\,\mathrm{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{15b^2d} - \frac{(12e^2)\,\mathrm{Subst}\left(\int \frac{x^2}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{5b^2d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{(24e^2)\,\mathrm{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right) dx, x, a+b\arcsin(c+dx)\right)}{5b^4d} - \frac{(16e^2)\,\mathrm{Subst}\left(\int \frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx, x, c+dx\right)}{15b^3d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{(16e^2)\,\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d} - \frac{(6e^2)\,\mathrm{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{5b^4d} + \frac{(18e^2)\,\mathrm{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{5b^4d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(16e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} + \frac{\left(6e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{5b^4d} - \frac{\left(18e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{5b^4d} + \frac{\left(16e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} - \frac{\left(6e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{5b^4d} + \frac{\left(18e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{5b^4d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(32e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} + \frac{\left(12e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d} - \frac{\left(36e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d} + \frac{\left(32e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} - \frac{\left(12e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d} + \frac{\left(36e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{5b^4d}$$

$$= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{2e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{6e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{5b^{7/2}d} - \frac{2e^2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d} + \frac{6e^2\sqrt{6\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{5b^{7/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.16 (sec) , antiderivative size = 538, normalized size of antiderivative = 1.22

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{e^2\left(-3b^2e^{i\arcsin(c+dx)}+3b^2e^{3i\arcsin(c+dx)}+2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(a+}{}}\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (e^2*(-3*b^2*E^(I*ArcSin[c + d*x]) + 3*b^2*E^((3*I)*ArcSin[c + d*x]) + (2*(
a + b*ArcSin[c + d*x])*(E^((I*(a + b*ArcSin[c + d*x]))/b)*(2*a - I*b + 2*b*
ArcSin[c + d*x]) - (2*I)*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1
/2, ((-I)*(a + b*ArcSin[c + d*x]))/b]))/E^((I*a)/b) + (4*a^2 + 2*a*b*(I + 4
*ArcSin[c + d*x]) + b^2*(-3 + (2*I)*ArcSin[c + d*x] + 4*ArcSin[c + d*x]^2)
- 4*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^2*Sqrt[(I*(a
+ b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b])/E^(I*Ar
cSin[c + d*x]) - (6*(a + b*ArcSin[c + d*x])*(E^(((3*I)*(a + b*ArcSin[c + d*
x]))/b)*(6*a - I*b + 6*b*ArcSin[c + d*x]) - (6*I)*Sqrt[3]*b*(((-I)*(a + b*A
rcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c + d*x]))/b]))/
E^(((3*I)*a)/b) + (3*(b^2 - 2*(a + b*ArcSin[c + d*x])*(6*a + I*b + 6*b*ArcS
in[c + d*x] + (6*I)*Sqrt[3]*b*E^(((3*I)*(a + b*ArcSin[c + d*x]))/b)*((I*(a
+ b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b
])))/E^((3*I)*ArcSin[c + d*x])))/(60*b^3*d*(a + b*ArcSin[c + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1246 vs. 2(367) = 734.

Time = 1.30 (sec) , antiderivative size = 1247, normalized size of antiderivative = 2.83

method	result	size
default	Expression too large to display	1247

```
[In] int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/30*e^2/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*Fresn
elS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(
1/2)*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*
FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)
*Pi^(1/2)*(-1/b)^(1/2)*b^2+36*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*ar
csin(d*x+c)^2*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2+36*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)*arcsin(d*x+c)^2*(-3/b)^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)
```

```
/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-8*arcsin(d*x+c)*(a+b*arcsin(
d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c)*(a+b*arcs
in(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b+72*2^(1/2)*Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*arcsin(d*x+c)*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^
(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b+72*2^(1/2)*Pi^
(1/2)*(a+b*arcsin(d*x+c))^(1/2)*arcsin(d*x+c)*(-3/b)^(1/2)*sin(3*a/b)*Fresn
elC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b-4*(a+b
*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a^2-4*(a+b*arcsin(d*x
+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a^2+36*2^(1/2)*Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2+36*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)*(-3/b)^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2+4*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c
))/b+a/b)*b^2-36*arcsin(d*x+c)^2*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b^2+8*
arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-2*arcsin(d*x+c)*sin(-(a+b
*arcsin(d*x+c))/b+a/b)*b^2-72*arcsin(d*x+c)*cos(-3*(a+b*arcsin(d*x+c))/b+3*
a/b)*a*b+6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b^2+4*cos(-(a+
b*arcsin(d*x+c))/b+a/b)*a^2-3*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2-2*sin(-(a
+b*arcsin(d*x+c))/b+a/b)*a*b-36*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^2+3*c
os(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b^2+6*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b
)*a*b)/(a+b*arcsin(d*x+c))^(5/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e^2\Bigg(\int \frac{}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3a}$$
$$+\int \frac{d^2x^2}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+d}$$
$$+\int \frac{2cdx}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+d}$$

```
[In] integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] e**2*(Integral(c**2/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*a
sin(c + d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d
*x)**2 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(d*
*2*x**2/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x)
)*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**
3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(2*c*d*x/(a**3*
sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c + d*x
) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(a + b*a
sin(c + d*x))*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

```
[In] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(7/2),x)
[Out] int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(7/2), x)
```

3.278 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 252

$$\begin{aligned}\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx &= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} \\ &\quad -\frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}}+\frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} \\ &\quad +\frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}-\frac{32e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} \\ &\quad -\frac{32e\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d}\end{aligned}$$

```
[Out] -4/15*e/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*e*(d*x+c)^2/b^2/d/(a+b*arcsin(
d*x+c))^(3/2)-32/15*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2)/Pi^(1/2))*Pi^(1/2)/b^(7/2)/d-32/15*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(7/2)/d-2/5*e*(d*x+c)*(1-(d*x+c)^
2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2)+32/15*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/
b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {4889, 12, 4729, 4807, 4727, 3387, 3386, 3432, 3385, 3433, 4737}

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{32\sqrt{\pi}e\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} - \frac{32\sqrt{\pi}e\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} + \frac{32e\sqrt{1-(c+dx)^2}(c+dx)}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{2e\sqrt{1-(c+dx)^2}(c+dx)}{5bd(a+b\arcsin(c+dx))^{5/2}}$$

```
[In] Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] (-2*e*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(5*b*d*(a + b*ArcSin[c + d*x])^(5/2)
) - (4*e)/(15*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (8*e*(c + d*x)^2)/(15*
b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (32*e*(c + d*x)*Sqrt[1 - (c + d*x)^2
])/(15*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) - (32*e*Sqrt[Pi]*Cos[(2*a)/b]*Fre
snelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(15*b^(7/2)*d) -
 (32*e*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])
]*Sin[(2*a)/b])/(15*b^(7/2)*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
```

```
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{ex}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d}\\
&= \frac{e\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{(2e)\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd}\\
&\quad - \frac{(4e)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}}\\
&\quad + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{(16e)\text{Subst}\left(\int \frac{x}{(a+b\arcsin(x))^{3/2}}\,dx, x, c+dx\right)}{15b^2d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}}\\
&\quad + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad - \frac{(32e)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}\\
&= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}}\\
&\quad + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}\\
&\quad - \frac{\left(32e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}\\
&\quad - \frac{\left(32e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(c+dx)\right)}{15b^4d}
\end{aligned}
$$

$$= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{\left(64e\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} - \frac{\left(64e\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d}$$

$$= -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{32e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} - \frac{32e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.95 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.01

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{e\left((a+b\arcsin(c+dx))\left(e^{-\frac{2ia}{b}}\left(2e^{\frac{2i(a+b\arcsin(c+dx))}{b}}(4ia+b+4ib\arcsin(c+dx))+8\sqrt{2}b\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right.\right.\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(7/2),x]
```

```
[Out] -1/15*(e*((a + b*ArcSin[c + d*x])*((2*E^(((2*I)*(a + b*ArcSin[c + d*x]))/b)
*((4*I)*a + b + (4*I)*b*ArcSin[c + d*x]) + 8*Sqrt[2]*b*(((-I)*(a + b*ArcSin
[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2
*I)*a)/b) + (2*((-4*I)*a + b - (4*I)*b*ArcSin[c + d*x] + 4*Sqrt[2]*b*E^(((2
*I)*(a + b*ArcSin[c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma
[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/E^((2*I)*ArcSin[c + d*x])) + 3*b
^2*Sin[2*ArcSin[c + d*x]]))/(b^3*d*(a + b*ArcSin[c + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 624 vs. $2(208) = 416$.

Time = 0.85 (sec) , antiderivative size = 625, normalized size of antiderivative = 2.48

method	result
default	$-\frac{e\left(32\arcsin(dx+c)^{2}\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b^{2}-32\arcsin(dx+c)^{2}\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a}$

```
[In] int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
[Out] -1/15*e/d/b^3*(32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b)*b^2-32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*b^2+64*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*a*b-64*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*a*b+32*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2
*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*a^2-32*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS
(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2+16*arcsin
(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+32*arcsin(d*x+c)*sin(-2*(
a+b*arcsin(d*x+c))/b+2*a/b)*a*b+4*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/
b+2*a/b)*b^2+16*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2-3*sin(-2*(a+b*arcsi
n(d*x+c))/b+2*a/b)*b^2+4*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b)/(a+b*arcs
in(d*x+c))^(5/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{ce + dex}{(a + b\arcsin(c + dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e\Bigg(\int \frac{}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3a}$$

$$+\int \frac{dx}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3ab^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+d}$$

```
[In] integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] e*(Integral(c/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c
+ d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2
 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(d*x/(a**
3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c + d
*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(a + b
*asin(c + d*x))*asin(c + d*x)**3), x))
```

Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Giac [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{c\,e+d\,e\,x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(7/2),x)
[Out] int((c*e + d*e*x)/(a + b*asin(c + d*x))^(7/2), x)
```

3.279 $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 218

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{8\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}$$

```
[Out] 4/15*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*cos(a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-8/1
5*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(
1/2)*Pi^(1/2)/b^(7/2)/d-2/5*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/
2)+8/15*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {4887, 4717, 4807, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{8\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} - \frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

```
[Out] (-2*Sqrt[1 - (c + d*x)^2])/(5*b*d*(a + b*ArcSin[c + d*x])^(5/2)) + (4*(c +
d*x))/(15*b^2*d*(a + b*ArcSin[c + d*x])^(3/2)) + (8*Sqrt[1 - (c + d*x)^2])/
(15*b^3*d*Sqrt[a + b*ArcSin[c + d*x]]) + (8*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(S
qrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(15*b^(7/2)*d) - (8*Sqrt[2
*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(
15*b^(7/2)*d)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{(a+b\arcsin(x))^{7/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{2\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}(a+b\arcsin(x))^{5/2}}\,dx, x, c+dx\right)}{5bd}$$

$$=-\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} -\frac{4\text{Subst}\left(\int\frac{1}{(a+b\arcsin(x))^{3/2}}\,dx,x,c+dx\right)}{15b^2d}$$

$$=-\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} +\frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}+\frac{8\text{Subst}\left(\int\frac{x}{\sqrt{1-x^2}\sqrt{a+b\arcsin(x)}}\,dx,x,c+dx\right)}{15b^3d}$$

$$=-\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} +\frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}-\frac{8\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$=-\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} +\frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} +\frac{\left(8\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d} -\frac{\left(8\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(c+dx)\right)}{15b^4d}$$

$$=-\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}+\frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} +\frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} +\frac{\left(16\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d} -\frac{\left(16\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(c+dx)}\right)}{15b^4d}$$

$$= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{8\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.32

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{-6b^2e^{i\arcsin(c+dx)} + 4e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(a+b\arcsin(c+dx))}{b}}(2a+b(-i\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

```
[Out] (-6*b^2*E^(I*ArcSin[c + d*x]) + (4*(a + b*ArcSin[c + d*x])*(E^((I*(a + b*Ar
cSin[c + d*x]))/b)*(2*a + b*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*(((-I)*(a +
 b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b])
)/E^((I*a)/b) + (8*a^2 + 4*a*b*(I + 4*ArcSin[c + d*x]) + 2*b^2*(-3 + (2*I)*
ArcSin[c + d*x] + 4*ArcSin[c + d*x]^2) - 8*E^((I*(a + b*ArcSin[c + d*x]))/b
)*(a + b*ArcSin[c + d*x])^2*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2,
(I*(a + b*ArcSin[c + d*x]))/b])/E^(I*ArcSin[c + d*x]))/(30*b^3*d*(a + b*Arc
Sin[c + d*x])^(5/2))
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 623 vs. 2(178) = 356.

Time = 0.36 (sec) , antiderivative size = 624, normalized size of antiderivative = 2.86

method	result
default	$-\frac{\frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b^2}{15} - \frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\text{Fresne}}{15}}{}$

```
[In] int(1/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/15/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)
```

```
*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^
(1/2)*(-1/b)^(1/2)*b^2-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*F
resnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*
Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/
2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-4*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)
*(-1/b)^(1/2)*a^2-4*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/
2)*a^2+4*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c
)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+
c))/b+a/b)*b^2+4*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-3*cos(-(a+b*arcsin(d*x
+c))/b+a/b)*b^2-2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b*arcsin(d*x+c))^
(5/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**(-7/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}(c+d\,x))^{7/2}}\,dx$$

```
[In] int(1/(a + b*asin(c + d*x))^(7/2),x)
[Out] int(1/(a + b*asin(c + d*x))^(7/2), x)
```

3.280 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{7/2}},x\right)}{e}$$

```
[Out] Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(7/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx$$

```
[In] Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)),x]
[Out] Defer[Subst][Defer[Int][1/(x*(a + b*ArcSin[x])^(7/2)), x], x, c + d*x]/(d*e
)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{1}{ex(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{d}\\&=\frac{\text{Subst}\left(\int \frac{1}{x(a+b\arcsin(x))^{7/2}}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx$$

```
[In] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)),x]
[Out] Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.95 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{\frac{7}{2}}}dx$$

```
[In] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x)
[Out] int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 111.31 (sec) , antiderivative size = 221, normalized size of antiderivative = 8.84

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{}{a^3c\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+a^3dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2bc\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+}$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(7/2),x)
```

```
[Out] Integral(1/(a**3*c*sqrt(a + b*asin(c + d*x)) + a**3*d*x*sqrt(a + b*asin(c +
 d*x)) + 3*a**2*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 3*a**2*b*d*x*
sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 3*a*b**2*c*sqrt(a + b*asin(c + d*
x))*asin(c + d*x)**2 + 3*a*b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)
**2 + b**3*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3 + b**3*d*x*sqrt(a +
 b*asin(c + d*x))*asin(c + d*x)**3), x)/e
```

Maxima [N/A]

Not integrable

Time = 1.39 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2)), x)
```

Giac [N/A]

Not integrable

Time = 15.60 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
[Out] integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{7/2}}\,dx$$

```
[In] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2)),x)
[Out] int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2)), x)
```

3.281 $\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 156

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx=\frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d}+\frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d}+\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de}+\frac{28be^3\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{135d\sqrt{c+dx}}$$

```
[Out] 2/9*(e*(d*x+c))^(9/2)*(a+b*arcsin(d*x+c))/d/e+28/135*b*e^3*EllipticE(1/2*(-
d*x-c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/(d*x+c)^(1/2)+28/405*b*
e^2*(e*(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+4/81*b*(e*(d*x+c))^(7/2)*(1-(d*
x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 4723, 327, 326, 324, 435}

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx=\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de}+\frac{28be^3\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{135d\sqrt{c+dx}}+\frac{28be^2\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}}{405d}+\frac{4b\sqrt{1-(c+dx)^2}(e(c+dx))^{7/2}}{81d}$$

```
[In] Int[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (28*b*e^2*(e*(c + d*x))^(3/2)*Sqrt[1 - (c + d*x)^2])/(405*d) + (4*b*(e*(c +
 d*x))^(7/2)*Sqrt[1 - (c + d*x)^2])/(81*d) + (2*(e*(c + d*x))^(9/2)*(a + b*
ArcSin[c + d*x]))/(9*d*e) + (28*b*e^3*Sqrt[e*(c + d*x)]*EllipticE[ArcSin[Sq
rt[1 - c - d*x]/Sqrt[2]], 2])/(135*d*Sqrt[c + d*x])
```

Rule 324

```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[-2/(Sqrt[a]*(-b/a
)^(3/4)), Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b/
a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

Rule 326

```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[c*x]/
Sqrt[x], Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[
-b/a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (ex)^{7/2}(a+b\arcsin(x))\,dx, x, c+dx\right)}{d}$$

$$= \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} - \frac{(2b)\text{Subst}\left(\int \frac{(ex)^{9/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9de}$$

$$= \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} - \frac{(14be)\text{Subst}\left(\int \frac{(ex)^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{81d}$$

$$= \frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d} + \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} - \frac{(14be^3)\,\text{Subst}\left(\int \frac{\sqrt{ex}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{135d}$$

$$= \frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d} + \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} - \frac{\left(14be^3\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{x}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{135d\sqrt{c+dx}}$$

$$= \frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d} + \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} + \frac{\left(28be^3\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{1-2x^2}}{\sqrt{1-x^2}}\,dx, x, \frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)}{135d\sqrt{c+dx}}$$

$$= \frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d} + \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} + \frac{28be^3\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{135d\sqrt{c+dx}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.25 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.74

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{7/2}\left(45a(c+dx)^3+14b\sqrt{1-(c+dx)^2}+10b(c+dx)^2\sqrt{1-(c+dx)^2}\right.}{405d(c+d}$$

```
[In] Integrate[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (2*(e*(c + d*x))^(7/2)*(45*a*(c + d*x)^3 + 14*b*Sqrt[1 - (c + d*x)^2] + 10*
b*(c + d*x)^2*Sqrt[1 - (c + d*x)^2] + 45*b*(c + d*x)^3*ArcSin[c + d*x] - 14
*b*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]))/(405*d*(c + d*x)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.97 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.46

method	result
derivativedivides	$\frac{\frac{2a(dex+ce)^{\frac{9}{2}}}{9}+2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{9}-\frac{7e^4(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{45}-\frac{7e^5\sqrt{}}{}\right.}{}\right.}{de}$
default	$\frac{\frac{2a(dex+ce)^{\frac{9}{2}}}{9}+2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{9}-\frac{7e^4(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{45}-\frac{7e^5\sqrt{}}{}\right.}{}\right.}{de}$
parts	$\frac{2a(dex+ce)^{\frac{9}{2}}}{9de}+\frac{2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{9}-\frac{7e^4(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{45}-\right.}{}\right.}{ed}$

```
[In] int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(1/9*a*(d*e*x+c*e)^(9/2)+b*(1/9*(d*e*x+c*e)^(9/2)*arcsin(1/e*(d*e*x+c
*e))-2/9/e*(-1/9*e^2*(d*e*x+c*e)^(7/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-7/45*
e^4*(d*e*x+c*e)^(3/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-7/15*e^5/(1/e)^(1/2)*(
1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)
^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c*e)^(1
/2)*(1/e)^(1/2),I)))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.75

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx =$$
$$-\frac{2\left(42\sqrt{-d^3e}be^3\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\left(45\,ad^5e^3x^4+180\,acd^4e^3x^3+27\right.}{}$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] -2/405*(42*sqrt(-d^3*e)*b*e^3*weierstrassZeta(4/d^2, 0, weierstrassPInverse
(4/d^2, 0, (d*x + c)/d)) - (45*a*d^5*e^3*x^4 + 180*a*c*d^4*e^3*x^3 + 270*a*
c^2*d^3*e^3*x^2 + 180*a*c^3*d^2*e^3*x + 45*a*c^4*d*e^3 + 45*(b*d^5*e^3*x^4
+ 4*b*c*d^4*e^3*x^3 + 6*b*c^2*d^3*e^3*x^2 + 4*b*c^3*d^2*e^3*x + b*c^4*d*e^3
)*arcsin(d*x + c) + 2*(5*b*d^4*e^3*x^3 + 15*b*c*d^3*e^3*x^2 + (15*b*c^2 + 7
*b)*d^2*e^3*x + (5*b*c^3 + 7*b*c)*d*e^3)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
)*sqrt(d*e*x + c*e))/d^2
```

Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)**(7/2)*(a+b*asin(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx=\int (dex+ce)^{\frac{7}{2}}(b\arcsin(dx+c)+a)\,dx$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^(7/2)*(b*arcsin(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^{7/2}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x)),x)
```

```
[Out] int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x)), x)
```

3.282 $\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 136

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \frac{20be^2\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{147d} + \frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{20be^{5/2}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{147d}$$

```
[Out] 2/7*(e*(d*x+c))^(7/2)*(a+b*arcsin(d*x+c))/d/e-20/147*b*e^(5/2)*EllipticF((e
*(d*x+c))^(1/2)/e^(1/2),I)/d+4/49*b*(e*(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d
+20/147*b*e^2*(e*(d*x+c))^(1/2)*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {4889, 4723, 327, 335, 227}

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{20be^{5/2}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{147d} + \frac{20be^2\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}}{147d} + \frac{4b\sqrt{1-(c+dx)^2}(e(c+dx))^{5/2}}{49d}$$

```
[In] Int[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (20*b*e^2*Sqrt[e*(c + d*x)]*Sqrt[1 - (c + d*x)^2])/(147*d) + (4*b*(e*(c + d
*x))^(5/2)*Sqrt[1 - (c + d*x)^2])/(49*d) + (2*(e*(c + d*x))^(7/2)*(a + b*Ar
cSin[c + d*x]))/(7*d*e) - (20*b*e^(5/2)*EllipticF[ArcSin[Sqrt[e*(c + d*x)]/
Sqrt[e]], -1])/(147*d)
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 335

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k =
 Denominator[m]}, Dist[k/c, Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(k*n)/c^n
))^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && F
ractionQ[m] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (ex)^{5/2}(a+b\arcsin(x))\,dx, x, c+dx\right)}{d}$$

$$= \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{(2b)\text{Subst}\left(\int \frac{(ex)^{7/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{7de}$$

$$= \frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{(10be)\text{Subst}\left(\int \frac{(ex)^{3/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{49d}$$

$$= \frac{20be^2\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{147d} + \frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{(10be^3)\,\text{Subst}\left(\int \frac{1}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{147d}$$

$$= \frac{20be^2\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{147d} + \frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{(20be^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^4}{e^2}}}\,dx, x, \sqrt{e(c+dx)}\right)}{147d}$$

$$= \frac{20be^2\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{147d} + \frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de} - \frac{20be^{5/2}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{147d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.19 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.85

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{5/2}\left(21a(c+dx)^3 + 10b\sqrt{1-(c+dx)^2} + 6b(c+dx)^2\sqrt{1-(c+dx)^2} + 2\right.}{147d(c+dx)}$$

```
[In] Integrate[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (2*(e*(c + d*x))^(5/2)*(21*a*(c + d*x)^3 + 10*b*Sqrt[1 - (c + d*x)^2] + 6*b
*(c + d*x)^2*Sqrt[1 - (c + d*x)^2] + 21*b*(c + d*x)^3*ArcSin[c + d*x] - 10*
b*Hypergeometric2F1[1/4, 1/2, 5/4, (c + d*x)^2]))/(147*d*(c + d*x)^2)
```

Maple [A] (verified)

Time = 2.88 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.51

method	result
derivativedivides	$\frac{\frac{2a(dex+ce)^{\frac{7}{2}}}{7}+2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{7}-\frac{5e^{4}\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{21}+\frac{5e^{4}\sqrt{1-}}{}\right.}{7e}\right.}{de}$
default	$\frac{\frac{2a(dex+ce)^{\frac{7}{2}}}{7}+2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{7}-\frac{5e^{4}\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{21}+\frac{5e^{4}\sqrt{1-}}{}\right.}{7e}\right.}{de}$
parts	$\frac{2a(dex+ce)^{\frac{7}{2}}}{7de}+\frac{2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{7}-\frac{5e^{4}\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{21}+\frac{5e^{4}}{}\right.}{7e}\right.}{ed}$

```
[In] int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(1/7*a*(d*e*x+c*e)^(7/2)+b*(1/7*(d*e*x+c*e)^(7/2)*arcsin(1/e*(d*e*x+c
*e))-2/7/e*(-1/7*e^2*(d*e*x+c*e)^(5/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-5/21*
e^4*(d*e*x+c*e)^(1/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)+5/21*e^4/(1/e)^(1/2)*(
1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)
^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.62

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \frac{2\left(10\sqrt{-d^3e}be^2\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(21\,ad^5e^2x^3+63\,acd^4e^2x^2+63\,ac\right.\right.}{}$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] 2/147*(10*sqrt(-d^3*e)*b*e^2*weierstrassPInverse(4/d^2, 0, (d*x + c)/d) + (
21*a*d^5*e^2*x^3 + 63*a*c*d^4*e^2*x^2 + 63*a*c^2*d^3*e^2*x + 21*a*c^3*d^2*e
```

```
^2 + 21*(b*d^5*e^2*x^3 + 3*b*c*d^4*e^2*x^2 + 3*b*c^2*d^3*e^2*x + b*c^3*d^2*
e^2)*arcsin(d*x + c) + 2*(3*b*d^4*e^2*x^2 + 6*b*c*d^3*e^2*x + (3*b*c^2 + 5*
b)*d^2*e^2)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x + c*e))/d^3
```

Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)**(5/2)*(a+b*asin(d*x+c)),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \int (dex+ce)^{\frac{5}{2}}(b\arcsin(dx+c)+a)\,dx$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^(5/2)*(b*arcsin(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^{5/2}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x)), x)
```

3.283 $\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 117

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d}+\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de}+\frac{12be\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{25d\sqrt{c+dx}}$$

```
[Out] 2/5*(e*(d*x+c))^(5/2)*(a+b*arcsin(d*x+c))/d/e+12/25*b*e*EllipticE(1/2*(-d*x
-c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/(d*x+c)^(1/2)+4/25*b*(e*(d
*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 4723, 327, 326, 324, 435}

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de}+\frac{12be\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{25d\sqrt{c+dx}}+\frac{4b\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}}{25d}$$

```
[In] Int[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (4*b*(e*(c + d*x))^(3/2)*Sqrt[1 - (c + d*x)^2])/(25*d) + (2*(e*(c + d*x))^(
5/2)*(a + b*ArcSin[c + d*x]))/(5*d*e) + (12*b*e*Sqrt[e*(c + d*x)]*EllipticE
[ArcSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(25*d*Sqrt[c + d*x])
```

Rule 324

```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[-2/(Sqrt[a]*(-b/a
)^(3/4)), Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b/
a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

Rule 326

```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[c*x]/
Sqrt[x], Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[
-b/a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (ex)^{3/2}(a+b\arcsin(x))\,dx, x, c+dx\right)}{d}$$

$$= \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de} - \frac{(2b)\text{Subst}\left(\int \frac{(ex)^{5/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{5de}$$

$$
= \frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d} + \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de} - \frac{(6be)\text{Subst}\left(\int \frac{\sqrt{ex}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{25d}
$$

$$
= \frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d} + \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de} - \frac{\left(6be\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{x}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{25d\sqrt{c+dx}}
$$

$$
= \frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d} + \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de} + \frac{\left(12be\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{1-2x^2}}{\sqrt{1-x^2}}\,dx, x, \frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)}{25d\sqrt{c+dx}}
$$

$$
= \frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d} + \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de} + \frac{12be\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{25d\sqrt{c+dx}}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.06 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.74

$$
\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{3/2}\left(5ac+5adx+2b\sqrt{1-(c+dx)^2}+5bc\arcsin(c+dx)+5bdx\arcsin(c\right.}{25d}
$$

```
[In] Integrate[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (2*(e*(c + d*x))^(3/2)*(5*a*c + 5*a*d*x + 2*b*Sqrt[1 - (c + d*x)^2] + 5*b*c
*ArcSin[c + d*x] + 5*b*d*x*ArcSin[c + d*x] - 2*b*Hypergeometric2F1[1/2, 3/4
, 7/4, (c + d*x)^2]))/(25*d)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.45 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.66

method	result
derivativedivides	$\frac{\frac{2a(dex+ce)^{\frac{5}{2}}}{5}+2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\right.}{5\sqrt{\frac{1}{e}}\sqrt{}}\right.}{5e}\right.}{de}$
default	$\frac{\frac{2a(dex+ce)^{\frac{5}{2}}}{5}+2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\right.}{5\sqrt{\frac{1}{e}}\sqrt{}}\right.}{5e}\right.}{de}$
parts	$\frac{2a(dex+ce)^{\frac{5}{2}}}{5de}+\frac{2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{Ellip}\right.}{5\sqrt{}}\right.}{5e}\right.}{ed}$

```
[In] int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(1/5*a*(d*e*x+c*e)^(5/2)+b*(1/5*(d*e*x+c*e)^(5/2)*arcsin(1/e*(d*e*x+c
*e))-2/5/e*(-1/5*e^2*(d*e*x+c*e)^(3/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-3/5*e
^3/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*
(d*e*x+c*e)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-Elliptic
E((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.30

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx =$$

$$-\frac{2\left(6\sqrt{-d^3e}be\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\left(5\,ad^3ex^2+10\,acd^2ex+5\,ac^2de\right.\right.}{25\,d}$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] -2/25*(6*sqrt(-d^3*e)*b*e*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/d
^2, 0, (d*x + c)/d)) - (5*a*d^3*e*x^2 + 10*a*c*d^2*e*x + 5*a*c^2*d*e + 5*(b
*d^3*e*x^2 + 2*b*c*d^2*e*x + b*c^2*d*e)*arcsin(d*x + c) + 2*(b*d^2*e*x + b*
c*d*e)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x + c*e))/d^2
```

Sympy [F]

$$\int (ce + dex)^{3/2}(a + b \arcsin(c + dx))\, dx = \int (e(c + dx))^{\frac{3}{2}} (a + b \operatorname{asin}(c + dx))\, dx$$

```
[In] integrate((d*e*x+c*e)**(3/2)*(a+b*asin(d*x+c)),x)
```

```
[Out] Integral((e*(c + d*x))**(3/2)*(a + b*asin(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int (ce + dex)^{3/2}(a + b \arcsin(c + dx))\, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce + dex)^{3/2}(a + b \arcsin(c + dx))\, dx = \int (dex + ce)^{\frac{3}{2}} (b \arcsin(dx + c) + a)\, dx$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^(3/2)*(b*arcsin(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^{3/2}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x)), x)
```

3.284 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 99

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \frac{4b\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{9d} + \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{4b\sqrt{e}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{9d}$$

```
[Out] 2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))/d/e-4/9*b*EllipticF((e*(d*x+c))^(
1/2)/e^(1/2),I)*e^(1/2)/d+4/9*b*(e*(d*x+c))^(1/2)*(1-(d*x+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4889, 4723, 327, 335, 227}

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{4b\sqrt{e}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{9d} + \frac{4b\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}}{9d}$$

```
[In] Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] (4*b*Sqrt[e*(c + d*x)]*Sqrt[1 - (c + d*x)^2])/(9*d) + (2*(e*(c + d*x))^(3/2
)*(a + b*ArcSin[c + d*x]))/(3*d*e) - (4*b*Sqrt[e]*EllipticF[ArcSin[Sqrt[e*(
c + d*x)]/Sqrt[e]], -1])/(9*d)
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 335

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k =
 Denominator[m]}, Dist[k/c, Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(k*n)/c^n
))^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && F
ractionQ[m] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \sqrt{ex}(a+b\arcsin(x))\,dx, x, c+dx\right)}{d}$$

$$= \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{(2b)\text{Subst}\left(\int \frac{(ex)^{3/2}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de}$$

$$= \frac{4b\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{9d} + \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{(2be)\text{Subst}\left(\int \frac{1}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9d}$$

$$= \frac{4b\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{9d} + \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{(4b)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^4}{e^2}}}\,dx, x, \sqrt{e(c+dx)}\right)}{9d}$$

$$= \frac{4b\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{9d} + \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de} - \frac{4b\sqrt{e}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{9d}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \frac{2\sqrt{e(c+dx)}\left(3ac+3adx+2b\sqrt{1-(c+dx)^2}+3bc\arcsin(c+dx)+3bdx\arcsin(c+dx)-2b\,\text{Hypergeon}\right.}{9d}$$

```
[In] Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x]),x]
[Out] (2*Sqrt[e*(c + d*x)]*(3*a*c + 3*a*d*x + 2*b*Sqrt[1 - (c + d*x)^2] + 3*b*c*A
rcSin[c + d*x] + 3*b*d*x*ArcSin[c + d*x] - 2*b*Hypergeometric2F1[1/4, 1/2,
5/4, (c + d*x)^2]))/(9*d)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 171 vs. 2(81) = 162.

Time = 2.04 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.74

method	result
derivativedivides	$\frac{\frac{2(dex+ce)^{\frac{3}{2}}a}{3}+2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{c}\right.}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{3e}\right.}{de}$
default	$\frac{\frac{2(dex+ce)^{\frac{3}{2}}a}{3}+2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{c}\right.}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{3e}\right.}{de}$
parts	$\frac{2a(dex+ce)^{\frac{3}{2}}}{3de}+\frac{2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+}}\right.}{3e}\right.}{ed}$

```
[In] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(1/3*(d*e*x+c*e)^(3/2)*a+b*(1/3*(d*e*x+c*e)^(3/2)*arcsin(1/e*(d*e*x+c
*e))-2/3/e*(-1/3*e^2*(d*e*x+c*e)^(1/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)+1/3*e
^2/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*
(d*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.09

$$\int\sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$$
$$=\frac{2\left(2\sqrt{-d^3e}b\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(3\,ad^3x+3\,acd^2+2\sqrt{-d^2x^2-2\,cdx-c^2+1}bd^2+3\left(bd^3\right.\right.\right.}{9\,d^3}$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] 2/9*(2*sqrt(-d^3*e)*b*weierstrassPInverse(4/d^2, 0, (d*x + c)/d) + (3*a*d^3
*x + 3*a*c*d^2 + 2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*b*d^2 + 3*(b*d^3*x +
b*c*d^2)*arcsin(d*x + c))*sqrt(d*e*x + c*e))/d^3
```

Sympy [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx=\int \sqrt{e\,(c+dx)}(a+b\operatorname{asin}{(c+dx)})\,dx$$

```
[In] integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c)),x)
[Out] Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx=\int \sqrt{dex+ce}(b\arcsin{(dx+c)}+a)\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx=\int \sqrt{c\,e+d\,e\,x}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x)), x)
```

3.285 $\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 81

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{de\sqrt{c+dx}}$$

```
[Out] 2*(a+b*arcsin(d*x+c))*(e*(d*x+c))^(1/2)/d/e+4*b*EllipticE(1/2*(-d*x-c+1)^(1
/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e/(d*x+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {4889, 4723, 326, 324, 435}

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{de\sqrt{c+dx}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/Sqrt[c*e + d*e*x],x]
```

```
[Out] (2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x]))/(d*e) + (4*b*Sqrt[e*(c + d*x)
]*EllipticE[ArcSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(d*e*Sqrt[c + d*x])
```

Rule 324

```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[-2/(Sqrt[a]*(-b/a
)^(3/4)), Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b/
a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

Rule 326

```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[c*x]/
Sqrt[x], Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[
-b/a, 0]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{ex}}\,dx, x, c+dx\right)}{d}\\
&= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} - \frac{(2b)\text{Subst}\left(\int \frac{\sqrt{ex}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de}\\
&= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} - \frac{\left(2b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{x}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de\sqrt{c+dx}}\\
&= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} + \frac{\left(4b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{1-2x^2}}{\sqrt{1-x^2}}\,dx, x, \frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)}{de\sqrt{c+dx}}\\
&= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{de\sqrt{c+dx}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.73

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = -\frac{2\sqrt{e(c+dx)}\left(-3(a+b\arcsin(c+dx))+2b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)\right)}{3de}$$

[In] Integrate[(a + b*ArcSin[c + d*x])/Sqrt[c*e + d*e*x],x]

[Out] (-2*Sqrt[e*(c + d*x)]*(-3*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]))/(3*d*e)

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.77 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.84

method	result
derivativedivides	$\frac{2\sqrt{dex+ce}\,a+2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+ce}\,\sqrt{\ldots}\right.\right.}{\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{de}$
default	$\frac{2\sqrt{dex+ce}\,a+2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+ce}\,\sqrt{\ldots}\right.\right.}{\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{de}$
parts	$\frac{2a\sqrt{dex+ce}}{de}+\frac{2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+c\ldots}\right.\right.}{\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{ed}$

[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x,method=_RETURNVERBOSE)

[Out] 2/d/e*((d*e*x+c*e)^(1/2)*a+b*((d*e*x+c*e)^(1/2)*arcsin(1/e*(d*e*x+c*e))+2/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.84

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = -\frac{2\left(2\sqrt{-d^3e}b\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\sqrt{dex+ce}(bd\arcsin\left(dx+c\right)+a}{d^2e}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
```

```
[Out] -2*(2*sqrt(-d^3*e)*b*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/d^2, 0
, (d*x + c)/d)) - sqrt(d*e*x + c*e)*(b*d*arcsin(d*x + c) + a*d))/(d^2*e)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \int \frac{b\arcsin(dx+c)+a}{\sqrt{dex+ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)/sqrt(d*e*x + c*e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{\sqrt{c\,e+d\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(1/2),x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(1/2), x)
```

3.286 $\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{3/2}} dx$

Optimal result

Integrand size = 23, antiderivative size = 61

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}}+\frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{de^{3/2}}$$

```
[Out] 4*b*EllipticF((e*(d*x+c))^(1/2)/e^(1/2),I)/d/e^(3/2)-2*(a+b*arcsin(d*x+c))/
d/e/(e*(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {4889, 4723, 335, 227}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=\frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{de^{3/2}}-\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(3/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x]))/(d*e*Sqrt[e*(c + d*x)]) + (4*b*EllipticF[ArcSi
n[Sqrt[e*(c + d*x)]/Sqrt[e]], -1])/(d*e^(3/2))
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 335

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k =
 Denominator[m]}, Dist[k/c, Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(k*n)/c^n
))^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && F
ractionQ[m] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{3/2}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de} \\
&= -\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}} + \frac{(4b)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^4}{e^2}}}\,dx, x, \sqrt{e(c+dx)}\right)}{de^2} \\
&= -\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}} + \frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{de^{3/2}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.03 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.89

$$
\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(a+b\arcsin(c+dx)-2b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)\right)}{de\sqrt{e(c+dx)}}
$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(3/2),x]
[Out] (-2*(a + b*ArcSin[c + d*x] - 2*b*(c + d*x)*Hypergeometric2F1[1/4, 1/2, 5/4,
 (c + d*x)^2]))/(d*e*Sqrt[e*(c + d*x)])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 131 vs. $2(53) = 106$.

Time = 1.53 (sec) , antiderivative size = 132, normalized size of antiderivative = 2.16

method	result	size
derivativedivides	$\frac{-\frac{2a}{\sqrt{dex+ce}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{de}$	132
default	$\frac{-\frac{2a}{\sqrt{dex+ce}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{de}$	132
parts	$-\frac{2a}{\sqrt{dex+ce}\,de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{ed}$	137

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x,method=_RETURNVERBOSE)
[Out] 2/d/e*(-a/(d*e*x+c*e)^(1/2)+b*(-1/(d*e*x+c*e)^(1/2)*arcsin(1/e*(d*e*x+c*e))
+2/e/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^
2*(d*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.38

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(2\sqrt{-d^3e}(bdx+bc)\operatorname{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(bd^2\arcsin\left(dx+c\right)+ad^2\right)\sqrt{dex+ce}\right)}{d^4e^2x+cd^3e^2}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
[Out] -2*(2*sqrt(-d^3*e)*(b*d*x + b*c)*weierstrassPInverse(4/d^2, 0, (d*x + c)/d)
 + (b*d^2*arcsin(d*x + c) + a*d^2)*sqrt(d*e*x + c*e))/(d^4*e^2*x + c*d^3*e^
2)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=\int \frac{a+b\operatorname{asin}{(c+dx)}}{(e\,(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=\int \frac{b\arcsin{(dx+c)}+a}{(dex+ce)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(3/2), x)
```

3.287 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 122

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{3de^3\sqrt{c+dx}}$$

```
[Out] -2/3*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(3/2)+4/3*b*EllipticE(1/2*(-d*x-c+
1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e^3/(d*x+c)^(1/2)-4/3*b*(1-(d
*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {4889, 4723, 331, 326, 324, 435}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{3de^3\sqrt{c+dx}} - \frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-4*b*Sqrt[1 - (c + d*x)^2])/(3*d*e^2*Sqrt[e*(c + d*x)]) - (2*(a + b*ArcSin
[c + d*x]))/(3*d*e*(e*(c + d*x))^(3/2)) + (4*b*Sqrt[e*(c + d*x)]*EllipticE[
ArcSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(3*d*e^3*Sqrt[c + d*x])
```

Rule 324

```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[-2/(Sqrt[a]*(-b/a
)^(3/4)), Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b/
a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

Rule 326

```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[c*x]/
Sqrt[x], Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[
-b/a, 0]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{5/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{(ex)^{3/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} - \frac{(2b)\text{Subst}\left(\int \frac{\sqrt{ex}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^3}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} - \frac{\left(2b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{x}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de^3\sqrt{c+dx}}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{\left(4b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{1-2x^2}}{\sqrt{1-x^2}}\,dx, x, \frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)}{3de^3\sqrt{c+dx}}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{3de^3\sqrt{c+dx}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.46

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = -\frac{2\left(a+b\arcsin(c+dx)+2b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)\right)}{3de(e(c+dx))^{3/2}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x] + 2*b*(c + d*x)*Hypergeometric2F1[-1/4, 1/2, 3/4
, (c + d*x)^2]))/(3*d*e*(e*(c + d*x))^(3/2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.72 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.56

method	result
derivativedivides	$\frac{-\frac{2a}{3(dex+ce)^{\frac{3}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{Ellipti}\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{de}$
default	$\frac{-\frac{2a}{3(dex+ce)^{\frac{3}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{Ellipti}\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{de}$
parts	$-\frac{2a}{3(dex+ce)^{\frac{3}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{ed}$

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(-1/3*a/(d*e*x+c*e)^(3/2)+b*(-1/3/(d*e*x+c*e)^(3/2)*arcsin(1/e*(d*e*x
+c*e))+2/3/e*(-(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(1/2)+1/e/(1/e)^(
1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e
)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c
*e)^(1/2)*(1/e)^(1/2),I)))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.21

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx =$$
$$-\frac{2\left(2\left(bd^2x^2+2\,bcdx+bc^2\right)\sqrt{-d^3e}\,\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)+\sqrt{dex+ce}\left(bc\right.\right.}{3\left(d^4e^3x^2+2\,cd^3e^3x+c^2d^2e^3\right)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*(2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*sqrt(-d^3*e)*weierstrassZeta(4/d^2,
 0, weierstrassPInverse(4/d^2, 0, (d*x + c)/d)) + sqrt(d*e*x + c*e)*(b*d*ar
csin(d*x + c) + a*d + 2*(b*d^2*x + b*c*d)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)))/(d^4*e^3*x^2 + 2*c*d^3*e^3*x + c^2*d^2*e^3)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(c+dx)}{(e\,(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\int \frac{b\arcsin(dx+c)+a}{(dex+ce)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^{5/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(5/2), x)
```

3.288 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}} \, dx$

Optimal result

Integrand size = 23, antiderivative size = 102

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}} \, dx = -\frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{15de^{7/2}}$$

```
[Out] -2/5*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(5/2)+4/15*b*EllipticF((e*(d*x+c))
^(1/2)/e^(1/2),I)/d/e^(7/2)-4/15*b*(1-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^(3
/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4889, 4723, 331, 335, 227}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}} \, dx = -\frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{15de^{7/2}} - \frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(7/2),x]
```

```
[Out] (-4*b*Sqrt[1 - (c + d*x)^2])/(15*d*e^2*(e*(c + d*x))^(3/2)) - (2*(a + b*Arc
Sin[c + d*x]))/(5*d*e*(e*(c + d*x))^(5/2)) + (4*b*EllipticF[ArcSin[Sqrt[e*(
c + d*x)]/Sqrt[e]], -1])/(15*d*e^(7/2))
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 335

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k =
 Denominator[m]}, Dist[k/c, Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(k*n)/c^n
))^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && F
ractionQ[m] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{7/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{(ex)^{5/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{5de}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{15de^3}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{(4b)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^4}{e^2}}}\,dx, x, \sqrt{e(c+dx)}\right)}{15de^4}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{15de^{7/2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \frac{-6(a+b\arcsin(c+dx)) - 4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{3}{4}, \frac{1}{2}, \frac{1}{4}, (c+dx)^2\right)}{15de(e(c+dx))^{5/2}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(7/2),x]
[Out] (-6*(a + b*ArcSin[c + d*x]) - 4*b*(c + d*x)*Hypergeometric2F1[-3/4, 1/2, 1/
4, (c + d*x)^2])/(15*d*e*(e*(c + d*x))^(5/2))
```

Maple [A] (verified)

Time = 2.10 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.66

method	result
derivativedivides	$\frac{-\frac{2a}{5(dex+ce)^{\frac{5}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{de}$
default	$\frac{-\frac{2a}{5(dex+ce)^{\frac{5}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{de}$
parts	$-\frac{2a}{5(dex+ce)^{\frac{5}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{ed}$

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(-1/5*a/(d*e*x+c*e)^(5/2)+b*(-1/5/(d*e*x+c*e)^(5/2)*arcsin(1/e*(d*e*x
+c*e))+2/5/e*(-1/3*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(3/2)+1/3/e^2
/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d
*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.72

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = -\frac{2\left(2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\sqrt{-d^3e}\,\mathrm{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(3\,bd^2\arcsin\left(dx+c\right)+3\,c\right.\right.}{15\left(d^6e^4x^3+3\,cd^5e^4x^2+3\,c^2d^4e^4x+c^3d^3e^4\right)}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="fricas")
```

```
[Out] -2/15*(2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*sqrt(-d^3*e)*wei
erstrassPInverse(4/d^2, 0, (d*x + c)/d) + (3*b*d^2*arcsin(d*x + c) + 3*a*d^
2 + 2*(b*d^3*x + b*c*d^2)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x +
c*e))/(d^6*e^4*x^3 + 3*c*d^5*e^4*x^2 + 3*c^2*d^4*e^4*x + c^3*d^3*e^4)
```

Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(c+dx)}{\left(e\,(c+dx)\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(7/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(7/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx=\int \frac{b\arcsin\left(dx+c\right)+a}{(dex+ce)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(7/2),x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(7/2), x)
```

3.289 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 159

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}}-\frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}}-\frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}}+\frac{12b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{35de^5\sqrt{c+dx}}$$

```
[Out] -2/7*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(7/2)+12/35*b*EllipticE(1/2*(-d*x-
c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e^5/(d*x+c)^(1/2)-4/35*b*(1
-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^(5/2)-12/35*b*(1-(d*x+c)^2)^(1/2)/d/e^4
/(e*(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4889, 4723, 331, 326, 324, 435}

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}}+\frac{12b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{35de^5\sqrt{c+dx}}-\frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}}-\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(9/2),x]
```

```
[Out] (-4*b*Sqrt[1 - (c + d*x)^2])/(35*d*e^2*(e*(c + d*x))^(5/2)) - (12*b*Sqrt[1
- (c + d*x)^2])/(35*d*e^4*Sqrt[e*(c + d*x)]) - (2*(a + b*ArcSin[c + d*x]))/
```

```
(7*d*e*(e*(c + d*x))^(7/2)) + (12*b*Sqrt[e*(c + d*x)]*EllipticE[ArcSin[Sqrt
[1 - c - d*x]/Sqrt[2]], 2])/(35*d*e^5*Sqrt[c + d*x])
```

Rule 324

```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[-2/(Sqrt[a]*(-b/a
)^(3/4)), Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b/
a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

Rule 326

```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Dist[Sqrt[c*x]/
Sqrt[x], Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ[
-b/a, 0]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{9/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{(ex)^{7/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{7de}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}} - \frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} + \frac{(6b)\text{Subst}\left(\int \frac{1}{(ex)^{3/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{35de^3}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}} - \frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} - \frac{(6b)\text{Subst}\left(\int \frac{\sqrt{ex}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{35de^5}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}} - \frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} - \frac{\left(6b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{x}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{35de^5\sqrt{c+dx}}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}} - \frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} + \frac{\left(12b\sqrt{e(c+dx)}\right)\text{Subst}\left(\int \frac{\sqrt{1-2x^2}}{\sqrt{1-x^2}}\,dx, x, \frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)}{35de^5\sqrt{c+dx}}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}} - \frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}} + \frac{12b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{35de^5\sqrt{c+dx}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.06 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.42

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = -\frac{2\sqrt{e(c+dx)}\left(5(a+b\arcsin(c+dx))+2b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)\right)}{35de^5(c+dx)^4}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(9/2),x]
```

```
[Out] (-2*Sqrt[e*(c + d*x)]*(5*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeome
tric2F1[-5/4, 1/2, -1/4, (c + d*x)^2]))/(35*d*e^5*(c + d*x)^4)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.53 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.42

method	result
derivativedivides	$\frac{-\frac{2a}{7(dex+ce)^{\frac{7}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{d}\right.\right.}{35e^3\sqrt{\frac{1}{e}}\sqrt{-}}}{e}\right.}{de}$
default	$\frac{-\frac{2a}{7(dex+ce)^{\frac{7}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{d}\right.\right.}{35e^3\sqrt{\frac{1}{e}}\sqrt{-}}}{e}\right.}{de}$
parts	$-\frac{2a}{7(dex+ce)^{\frac{7}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{Ellipti}\right.}{35e^3\sqrt{}}}{e}\right.}{ed}$

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(-1/7*a/(d*e*x+c*e)^(7/2)+b*(-1/7/(d*e*x+c*e)^(7/2)*arcsin(1/e*(d*e*x
+c*e))+2/7/e*(-1/5*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(5/2)-3/5/e^2
*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(1/2)+3/5/e^3/(1/e)^(1/2)*(1-1/
e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)^(1/
2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c*e)^(1/2)*
(1/e)^(1/2),I)))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.48

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx =$$

$$-\frac{2\left(6\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4\right)\sqrt{-d^3e}\,\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0\right.\right.\right.}{35\left(d^6e^5x^4+4\,\right.}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="fricas")
```

```
[Out] -2/35*(6*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4
)*sqrt(-d^3*e)*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/d^2, 0, (d*x
 + c)/d)) + sqrt(d*e*x + c*e)*(5*b*d*arcsin(d*x + c) + 5*a*d + 2*(3*b*d^4*x
^3 + 9*b*c*d^3*x^2 + (9*b*c^2 + b)*d^2*x + (3*b*c^3 + b*c)*d)*sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)))/(d^6*e^5*x^4 + 4*c*d^5*e^5*x^3 + 6*c^2*d^4*e^5*x^2
+ 4*c^3*d^3*e^5*x + c^4*d^2*e^5)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(9/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx=\int \frac{b\arcsin(dx+c)+a}{(dex+ce)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{9/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(9/2),x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(9/2), x)
```

3.290 $\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}}\, dx$

Optimal result

Integrand size = 23, antiderivative size = 139

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}}\, dx = -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{20b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{189de^{11/2}}$$

```
[Out] -2/9*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(9/2)+20/189*b*EllipticF((e*(d*x+c
))^(1/2)/e^(1/2),I)/d/e^(11/2)-4/63*b*(1-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))
^(7/2)-20/189*b*(1-(d*x+c)^2)^(1/2)/d/e^4/(e*(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4889, 4723, 331, 335, 227}

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}}\, dx = -\frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{20b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{189de^{11/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(11/2),x]
```

```
[Out] (-4*b*Sqrt[1 - (c + d*x)^2])/(63*d*e^2*(e*(c + d*x))^(7/2)) - (20*b*Sqrt[1
 - (c + d*x)^2])/(189*d*e^4*(e*(c + d*x))^(3/2)) - (2*(a + b*ArcSin[c + d*x]
))/(9*d*e*(e*(c + d*x))^(9/2)) + (20*b*EllipticF[ArcSin[Sqrt[e*(c + d*x)]/S
qrt[e]], -1])/(189*d*e^(11/2))
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 335

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k =
 Denominator[m]}, Dist[k/c, Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(k*n)/c^n
))^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && F
ractionQ[m] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{11/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{(2b)\text{Subst}\left(\int \frac{1}{(ex)^{9/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{9de}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{(10b)\text{Subst}\left(\int \frac{1}{(ex)^{5/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{63de^3}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{(10b)\text{Subst}\left(\int \frac{1}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{189de^5}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{(20b)\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{x^4}{e^2}}}\,dx, x, \sqrt{e(c+dx)}\right)}{189de^6}$$

$$= -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{20b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{189de^{11/2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.05 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.47

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = -\frac{2\sqrt{e(c+dx)}\left(7(a+b\arcsin(c+dx)) + 2b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{7}{4}, \frac{1}{2}, -\frac{3}{4}, (c+dx)^2\right)\right)}{63de^6(c+dx)^5}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(11/2),x]
[Out] (-2*Sqrt[e*(c + d*x)]*(7*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeome
tric2F1[-7/4, 1/2, -3/4, (c + d*x)^2]))/(63*d*e^6*(c + d*x)^5)
```

Maple [A] (verified)

Time = 3.02 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.46

method	result
derivativedivides	$-\frac{2a}{9(dex+ce)^{\frac{9}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{EllipticF}\left(\sqrt{c\right.}}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.$ over de
default	$-\frac{2a}{9(dex+ce)^{\frac{9}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{EllipticF}\left(\sqrt{c\right.}}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.$ over de
parts	$-\frac{2a}{9(dex+ce)^{\frac{9}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{Ellipt}}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+}{e^2}}}}{e}\right.}{ed}$

```
[In] int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/d/e*(-1/9*a/(d*e*x+c*e)^(9/2)+b*(-1/9/(d*e*x+c*e)^(9/2)*arcsin(1/e*(d*e*x
+c*e))+2/9/e*(-1/7*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(7/2)-5/21/e^
2*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(3/2)+5/21/e^4/(1/e)^(1/2)*(1-
1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)^(
1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.89

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx =$$

$$-\frac{2\left(10\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+10\,bc^3d^2x^2+5\,bc^4dx+bc^5\right)\sqrt{-d^3e}\,\mathrm{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)}{189\left(d^8e^6x^5+5\,cd^7e^6x\right.}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="fricas")
```

```
[Out] -2/189*(10*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10*b*c^3*d^2*x^2
 + 5*b*c^4*d*x + b*c^5)*sqrt(-d^3*e)*weierstrassPInverse(4/d^2, 0, (d*x + c
)/d) + (21*b*d^2*arcsin(d*x + c) + 21*a*d^2 + 2*(5*b*d^5*x^3 + 15*b*c*d^4*x
^2 + 3*(5*b*c^2 + b)*d^3*x + (5*b*c^3 + 3*b*c)*d^2)*sqrt(-d^2*x^2 - 2*c*d*x
```

```
 - c^2 + 1))*sqrt(d*e*x + c*e))/(d^8*e^6*x^5 + 5*c*d^7*e^6*x^4 + 10*c^2*d^6
*e^6*x^3 + 10*c^3*d^5*e^6*x^2 + 5*c^4*d^4*e^6*x + c^5*d^3*e^6)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(11/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \int \frac{b\arcsin(dx+c)+a}{(dex+ce)^{\frac{11}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(11/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{11/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(11/2),x)
[Out] int((a + b*asin(c + d*x))/(c*e + d*e*x)^(11/2), x)
```

3.291 $\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9de}-\frac{8b(e(c+dx))^{11/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{11}{4},\frac{15}{4},(c+dx)^2\right)}{99de^2}+\frac{16b^2(e(c+dx))^{13/2}\,{}_3F_2\left(1,\frac{13}{4},\frac{13}{4};\frac{15}{4},\frac{17}{4};(c+dx)^2\right)}{1287de^3}$$

```
[Out] 2/9*(e*(d*x+c))^(9/2)*(a+b*arcsin(d*x+c))^2/d/e-8/99*b*(e*(d*x+c))^(11/2)*(
a+b*arcsin(d*x+c))*hypergeom([1/2, 11/4],[15/4],(d*x+c)^2)/d/e^2+16/1287*b^
2*(e*(d*x+c))^(13/2)*hypergeom([1, 13/4, 13/4],[15/4, 17/4],(d*x+c)^2)/d/e^
3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\frac{16b^2(e(c+dx))^{13/2}\,{}_3F_2\left(1,\frac{13}{4},\frac{13}{4};\frac{15}{4},\frac{17}{4};(c+dx)^2\right)}{1287de^3}-\frac{8b(e(c+dx))^{11/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{11}{4},\frac{15}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{99de^2}+\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9de}$$

```
[In] Int[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(9/2)*(a + b*ArcSin[c + d*x])^2)/(9*d*e) - (8*b*(e*(c + d*
x))^(11/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 11/4, 15/4, (c +
d*x)^2])/(99*d*e^2) + (16*b^2*(e*(c + d*x))^(13/2)*HypergeometricPFQ[{1, 13
/4, 13/4}, {15/4, 17/4}, (c + d*x)^2])/(1287*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (ex)^{7/2}(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}\\
&= \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9de}-\frac{(4b)\text{Subst}\left(\int \frac{(ex)^{9/2}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{9de}\\
&= \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9de}\\
&\quad -\frac{8b(e(c+dx))^{11/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{11}{4},\frac{15}{4},(c+dx)^2\right)}{99de^2}\\
&\quad +\frac{16b^2(e(c+dx))^{13/2}\,{}_3F_2\left(1,\frac{13}{4},\frac{13}{4};\frac{15}{4},\frac{17}{4};(c+dx)^2\right)}{1287de^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.88

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2e^3(c+dx)^4\sqrt{e(c+dx)}\left(13(a+b\arcsin(c+dx))\left(11(a+b\arcsin(c+dx))-4b(c+\right.\right.}{}$$

```
[In] Integrate[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*e^3*(c + d*x)^4*Sqrt[e*(c + d*x)]*(13*(a + b*ArcSin[c + d*x])*(11*(a + b
*ArcSin[c + d*x]) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 11/4, 15/4, (c + d
*x)^2]) + 8*b^2*(c + d*x)^2*HypergeometricPFQ[{1, 13/4, 13/4}, {15/4, 17/4}
, (c + d*x)^2]))/(1287*d)
```

Maple [F]

$$\int (dex+ce)^{\frac{7}{2}}(a+b\arcsin(dx+c))^2\,dx$$

```
[In] int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x)
```

```
[Out] int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x)
```

Fricas [F]

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{7}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*d^3*e^3*x^3 + 3*a^2*c*d^2*e^3*x^2 + 3*a^2*c^2*d*e^3*x + a^2*c
^3*e^3 + (b^2*d^3*e^3*x^3 + 3*b^2*c*d^2*e^3*x^2 + 3*b^2*c^2*d*e^3*x + b^2*c
^3*e^3)*arcsin(d*x + c)^2 + 2*(a*b*d^3*e^3*x^3 + 3*a*b*c*d^2*e^3*x^2 + 3*a*
b*c^2*d*e^3*x + a*b*c^3*e^3)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (ce + dex)^{7/2}(a + b\arcsin(c + dx))^2\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)**(7/2)*(a+b*asin(d*x+c))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (ce + dex)^{7/2}(a + b\arcsin(c + dx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce + dex)^{7/2}(a + b\arcsin(c + dx))^2\,dx = \int (dex + ce)^{\frac{7}{2}}(b\arcsin(dx + c) + a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^(7/2)*(b*arcsin(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce + dex)^{7/2}(a + b\arcsin(c + dx))^2\,dx = \int (c\,e + d\,e\,x)^{7/2}\,(a + b\,\mathrm{asin}(c + d\,x))^2\,dx$$

```
[In] int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x))^2, x)
```

3.292 $\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7de} - \frac{8b(e(c+dx))^{9/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{9}{4},\frac{13}{4},(c+dx)^2\right)}{63de^2} + \frac{16b^2(e(c+dx))^{11/2}\,{}_3F_2\left(1,\frac{11}{4},\frac{11}{4};\frac{13}{4},\frac{15}{4};(c+dx)^2\right)}{693de^3}$$

```
[Out] 2/7*(e*(d*x+c))^(7/2)*(a+b*arcsin(d*x+c))^2/d/e-8/63*b*(e*(d*x+c))^(9/2)*(a
+b*arcsin(d*x+c))*hypergeom([1/2, 9/4],[13/4],(d*x+c)^2)/d/e^2+16/693*b^2*(
e*(d*x+c))^(11/2)*hypergeom([1, 11/4, 11/4],[13/4, 15/4],(d*x+c)^2)/d/e^3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \frac{16b^2(e(c+dx))^{11/2}\,{}_3F_2\left(1,\frac{11}{4},\frac{11}{4};\frac{13}{4},\frac{15}{4};(c+dx)^2\right)}{693de^3} - \frac{8b(e(c+dx))^{9/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{9}{4},\frac{13}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{63de^2} + \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7de}$$

```
[In] Int[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(7/2)*(a + b*ArcSin[c + d*x])^2)/(7*d*e) - (8*b*(e*(c + d*
x))^(9/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 9/4, 13/4, (c + d*
x)^2])/(63*d*e^2) + (16*b^2*(e*(c + d*x))^(11/2)*HypergeometricPFQ[{1, 11/4
, 11/4}, {13/4, 15/4}, (c + d*x)^2])/(693*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (ex)^{5/2}(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{d} \\
&= \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7de} - \frac{(4b)\text{Subst}\left(\int \frac{(ex)^{7/2}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{7de} \\
&= \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7de} \\
&\quad - \frac{8b(e(c+dx))^{9/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{9}{4},\frac{13}{4},(c+dx)^2\right)}{63de^2} \\
&\quad + \frac{16b^2(e(c+dx))^{11/2}\,{}_3F_2\left(1,\frac{11}{4},\frac{11}{4};\frac{13}{4},\frac{15}{4};(c+dx)^2\right)}{693de^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{7/2}\left(99(a+b\arcsin(c+dx))^2-44b(c+dx)(a+b\arcsin(c+dx))\,\text{Hyper}\right.}{693d}$$

```
[In] Integrate[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(7/2)*(99*(a + b*ArcSin[c + d*x])^2 - 44*b*(c + d*x)*(a +
b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 9/4, 13/4, (c + d*x)^2] + 8*b^2*(
c + d*x)^2*HypergeometricPFQ[{1, 11/4, 11/4}, {13/4, 15/4}, (c + d*x)^2]))/
(693*d*e)
```

Maple [F]

$$\int (dex+ce)^{\frac{5}{2}}\left(a+b\arcsin\left(dx+c\right)\right)^{2}dx$$

```
[In] int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x)
```

```
[Out] int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x)
```

Fricas [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{5}{2}}\left(b\arcsin\left(dx+c\right)+a\right)^{2}dx$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*d^2*e^2*x^2 + 2*a^2*c*d*e^2*x + a^2*c^2*e^2 + (b^2*d^2*e^2*x^
2 + 2*b^2*c*d*e^2*x + b^2*c^2*e^2)*arcsin(d*x + c)^2 + 2*(a*b*d^2*e^2*x^2 +
 2*a*b*c*d*e^2*x + a*b*c^2*e^2)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \text{Timed out}$$

```
[In] integrate((d*e*x+c*e)**(5/2)*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{5}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^(5/2)*(b*arcsin(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \int (c\,e+d\,e\,x)^{5/2}\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

```
[In] int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x))^2,x)
```

```
[Out] int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x))^2, x)
```

3.293 $\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5de}-\frac{8b(e(c+dx))^{7/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{4},\frac{11}{4},(c+dx)^2\right)}{35de^2}+\frac{16b^2(e(c+dx))^{9/2}\,{}_3F_2\left(1,\frac{9}{4},\frac{9}{4};\frac{11}{4},\frac{13}{4};(c+dx)^2\right)}{315de^3}$$

```
[Out] 2/5*(e*(d*x+c))^(5/2)*(a+b*arcsin(d*x+c))^2/d/e-8/35*b*(e*(d*x+c))^(7/2)*(a
+b*arcsin(d*x+c))*hypergeom([1/2, 7/4],[11/4],(d*x+c)^2)/d/e^2+16/315*b^2*(
e*(d*x+c))^(9/2)*hypergeom([1, 9/4, 9/4],[11/4, 13/4],(d*x+c)^2)/d/e^3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\frac{16b^2(e(c+dx))^{9/2}\,{}_3F_2\left(1,\frac{9}{4},\frac{9}{4};\frac{11}{4},\frac{13}{4};(c+dx)^2\right)}{315de^3}-\frac{8b(e(c+dx))^{7/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{4},\frac{11}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{35de^2}+\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5de}$$

```
[In] Int[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(5/2)*(a + b*ArcSin[c + d*x])^2)/(5*d*e) - (8*b*(e*(c + d*
x))^(7/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 7/4, 11/4, (c + d*
x)^2])/(35*d*e^2) + (16*b^2*(e*(c + d*x))^(9/2)*HypergeometricPFQ[{1, 9/4,
9/4}, {11/4, 13/4}, (c + d*x)^2])/(315*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (ex)^{3/2}(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{d}\\
&= \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5de} - \frac{(4b)\text{Subst}\left(\int \frac{(ex)^{5/2}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{5de}\\
&= \frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5de}\\
&\quad - \frac{8b(e(c+dx))^{7/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{4},\frac{11}{4},(c+dx)^2\right)}{35de^2}\\
&\quad + \frac{16b^2(e(c+dx))^{9/2}\,{}_3F_2\left(1,\frac{9}{4},\frac{9}{4};\frac{11}{4},\frac{13}{4};(c+dx)^2\right)}{315de^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.82

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{5/2}\left(9(a+b\arcsin(c+dx))\left(7(a+b\arcsin(c+dx))-4b(c+dx)\,\mathrm{Hyperg}\right.\right.}{315de}$$

```
[In] Integrate[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(5/2)*(9*(a + b*ArcSin[c + d*x])*(7*(a + b*ArcSin[c + d*x]
) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 7/4, 11/4, (c + d*x)^2]) + 8*b^2*(
c + d*x)^2*HypergeometricPFQ[{1, 9/4, 9/4}, {11/4, 13/4}, (c + d*x)^2]))/(3
15*d*e)
```

Maple [F]

$$\int (dex+ce)^{\frac{3}{2}} (a+b\arcsin(dx+c))^2\,dx$$

```
[In] int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x)
```

```
[Out] int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x)
```

Fricas [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{3}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*d*e*x + a^2*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c)^2 + 2
*(a*b*d*e*x + a*b*c*e)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

Sympy [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (e(c+dx))^{\frac{3}{2}}(a+b\operatorname{asin}(c+dx))^2\,dx$$

```
[In] integrate((d*e*x+c*e)**(3/2)*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Integral((e*(c + d*x))**(3/2)*(a + b*asin(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{3}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^(3/2)*(b*arcsin(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (c\,e+d\,e\,x)^{3/2}\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

```
[In] int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x))^2,x)
```

```
[Out] int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x))^2, x)
```

3.294 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3de} - \frac{8b(e(c+dx))^{5/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},(c+dx)^2\right)}{15de^2} + \frac{16b^2(e(c+dx))^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};(c+dx)^2\right)}{105de^3}$$

```
[Out] 2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^2/d/e-8/15*b*(e*(d*x+c))^(5/2)*(a
+b*arcsin(d*x+c))*hypergeom([1/2, 5/4],[9/4],(d*x+c)^2)/d/e^2+16/105*b^2*(e
*(d*x+c))^(7/2)*hypergeom([1, 7/4, 7/4],[9/4, 11/4],(d*x+c)^2)/d/e^3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \frac{16b^2(e(c+dx))^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};(c+dx)^2\right)}{105de^3} - \frac{8b(e(c+dx))^{5/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{15de^2} + \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3de}$$

```
[In] Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(3/2)*(a + b*ArcSin[c + d*x])^2)/(3*d*e) - (8*b*(e*(c + d*
x))^(5/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 5/4, 9/4, (c + d*x
)^2])/(15*d*e^2) + (16*b^2*(e*(c + d*x))^(7/2)*HypergeometricPFQ[{1, 7/4, 7
/4}, {9/4, 11/4}, (c + d*x)^2])/(105*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \sqrt{ex}(a+b\arcsin(x))^2\,dx, x, c+dx\right)}{d}\\
&= \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3de}-\frac{(4b)\text{Subst}\left(\int \frac{(ex)^{3/2}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de}\\
&= \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3de}\\
&\quad -\frac{8b(e(c+dx))^{5/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},(c+dx)^2\right)}{15de^2}\\
&\quad +\frac{16b^2(e(c+dx))^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};(c+dx)^2\right)}{105de^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.82

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{2(e(c+dx))^{3/2}\left(7(a+b\arcsin(c+dx))\left(5(a+b\arcsin(c+dx))-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},\right.\right.\right.}{105de}$$

```
[In] Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] (2*(e*(c + d*x))^(3/2)*(7*(a + b*ArcSin[c + d*x])*(5*(a + b*ArcSin[c + d*x]
) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 5/4, 9/4, (c + d*x)^2]) + 8*b^2*(c
 + d*x)^2*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, (c + d*x)^2]))/(105
*d*e)
```

Maple [F]

$$\int \sqrt{dex+ce}\,(a+b\arcsin(dx+c))^2\,dx$$

```
[In] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x)
```

```
[Out] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x)
```

Fricas [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x +
 c*e), x)
```

Sympy [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\int \sqrt{e\,(c+dx)}(a+b\,\mathrm{asin}\,(c+dx))^2\,dx$$

```
[In] integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^2\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \int \sqrt{c\,e+d\,e\,x}\,{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^2\,dx$$

```
[In] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^2,x)
```

```
[Out] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^2, x)
```

3.295 $\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 128

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{de} - \frac{8b(e(c+dx))^{3/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)}{3de^2} + \frac{16b^2(e(c+dx))^{5/2}\,{}_3F_2\left(1,\frac{5}{4},\frac{5}{4};\frac{7}{4},\frac{9}{4};(c+dx)^2\right)}{15de^3}$$

```
[Out] -8/3*b*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))*hypergeom([1/2, 3/4],[7/4],(d*
x+c)^2)/d/e^2+16/15*b^2*(e*(d*x+c))^(5/2)*hypergeom([1, 5/4, 5/4],[7/4, 9/4
],(d*x+c)^2)/d/e^3+2*(a+b*arcsin(d*x+c))^2*(e*(d*x+c))^(1/2)/d/e
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \frac{16b^2(e(c+dx))^{5/2}\,{}_3F_2\left(1,\frac{5}{4},\frac{5}{4};\frac{7}{4},\frac{9}{4};(c+dx)^2\right)}{15de^3} - \frac{8b(e(c+dx))^{3/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{3de^2} + \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{de}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/Sqrt[c*e + d*e*x],x]
```

```
[Out] (2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x])^2)/(d*e) - (8*b*(e*(c + d*x))^
(3/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]
)/(3*d*e^2) + (16*b^2*(e*(c + d*x))^(5/2)*HypergeometricPFQ[{1, 5/4, 5/4},
{7/4, 9/4}, (c + d*x)^2])/(15*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{\sqrt{ex}}\,dx, x, c+dx\right)}{d}$$

$$= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{de} - \frac{(4b)\text{Subst}\left(\int \frac{\sqrt{ex}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de}$$

$$= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{de} - \frac{8b(e(c+dx))^{3/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)}{3de^2} + \frac{16b^2(e(c+dx))^{5/2}\,{}_3F_2\left(1,\frac{5}{4},\frac{5}{4};\frac{7}{4},\frac{9}{4};(c+dx)^2\right)}{15de^3}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}\left(5(a+b\arcsin(c+dx))\left(3(a+b\arcsin(c+dx))-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c\right.\right.\right.}{15de}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/Sqrt[c*e + d*e*x],x]
[Out] (2*Sqrt[e*(c + d*x)]*(5*(a + b*ArcSin[c + d*x])*(3*(a + b*ArcSin[c + d*x])
- 4*b*(c + d*x)*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]) + 8*b^2*(c +
 d*x)^2*HypergeometricPFQ[{1, 5/4, 5/4}, {7/4, 9/4}, (c + d*x)^2]))/(15*d*e
)
```

Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{\sqrt{dex+ce}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x)
[Out] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{\sqrt{dex+ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/sqrt(d*e*x +
 c*e), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(1/2),x)
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a + b\arcsin(c + dx))^2}{\sqrt{ce + dex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a + b\arcsin(c + dx))^2}{\sqrt{ce + dex}}\,dx = \int \frac{(b\arcsin(dx + c) + a)^2}{\sqrt{dex + ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^2/sqrt(d*e*x + c*e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a + b\arcsin(c + dx))^2}{\sqrt{ce + dex}}\,dx = \int \frac{(a + b\,\mathrm{asin}(c + d\,x))^2}{\sqrt{c\,e + d\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(1/2), x)
```

3.296 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 126

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{de\sqrt{e(c+dx)}} + \frac{8b\sqrt{e(c+dx)}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)}{de^2} - \frac{16b^2(e(c+dx))^{3/2}\,{}_3F_2\left(\frac{3}{4},\frac{3}{4},1;\frac{5}{4},\frac{7}{4};(c+dx)^2\right)}{3de^3}$$

```
[Out] -16/3*b^2*(e*(d*x+c))^(3/2)*hypergeom([3/4, 3/4, 1],[5/4, 7/4],(d*x+c)^2)/d
/e^3-2*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(1/2)+8*b*(a+b*arcsin(d*x+c))*
hypergeom([1/4, 1/2],[5/4],(d*x+c)^2)*(e*(d*x+c))^(1/2)/d/e^2
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = -\frac{16b^2(e(c+dx))^{3/2}\,{}_3F_2\left(\frac{3}{4},\frac{3}{4},1;\frac{5}{4},\frac{7}{4};(c+dx)^2\right)}{3de^3} + \frac{8b\sqrt{e(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{de^2} - \frac{2(a+b\arcsin(c+dx))^2}{de\sqrt{e(c+dx)}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(3/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^2)/(d*e*Sqrt[e*(c + d*x)]) + (8*b*Sqrt[e*(c + d
*x)]*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/4, 1/2, 5/4, (c + d*x)^2])
/(d*e^2) - (16*b^2*(e*(c + d*x))^(3/2)*HypergeometricPFQ[{3/4, 3/4, 1}, {5/
4, 7/4}, (c + d*x)^2])/(3*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{(ex)^{3/2}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{2(a+b\arcsin(c+dx))^2}{de\sqrt{e(c+dx)}} + \frac{(4b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{\sqrt{ex}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de}$$

$$= -\frac{2(a+b\arcsin(c+dx))^2}{de\sqrt{e(c+dx)}} + \frac{8b\sqrt{e(c+dx)}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)}{de^2} - \frac{16b^2(e(c+dx))^{3/2}\,{}_3F_2\left(\frac{3}{4},\frac{3}{4},1;\frac{5}{4},\frac{7}{4};(c+dx)^2\right)}{3de^3}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.83

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(3(a+b\arcsin(c+dx))\left(a+b\arcsin(c+dx)-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)\right)+8b^2}{3de\sqrt{e(c+dx)}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(3/2),x]
```

```
[Out] (-2*(3*(a + b*ArcSin[c + d*x])*(a + b*ArcSin[c + d*x] - 4*b*(c + d*x)*Hyper
geometric2F1[1/4, 1/2, 5/4, (c + d*x)^2]) + 8*b^2*(c + d*x)^2*Hypergeometri
cPFQ[{3/4, 3/4, 1}, {5/4, 7/4}, (c + d*x)^2]))/(3*d*e*Sqrt[e*(c + d*x)])
```

Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x +
 c*e)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c+dx))^2}{(e(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(3/2), x)
```

3.297 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{3de(e(c+dx))^{3/2}} - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)}{3de^2\sqrt{e(c+dx)}} + \frac{16b^2\sqrt{e(c+dx)}\,{}_3F_2\left(\frac{1}{4},\frac{1}{4},1;\frac{3}{4},\frac{5}{4};(c+dx)^2\right)}{3de^3}$$

```
[Out] -2/3*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(3/2)-8/3*b*(a+b*arcsin(d*x+c))*
hypergeom([-1/4, 1/2],[3/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(1/2)+16/3*b^2*hyp
ergeom([1/4, 1/4, 1],[3/4, 5/4],(d*x+c)^2)*(e*(d*x+c))^(1/2)/d/e^3
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \frac{16b^2\sqrt{e(c+dx)}\,{}_3F_2\left(\frac{1}{4},\frac{1}{4},1;\frac{3}{4},\frac{5}{4};(c+dx)^2\right)}{3de^3} - \frac{8b\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))^2}{3de(e(c+dx))^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^2)/(3*d*e*(e*(c + d*x))^(3/2)) - (8*b*(a + b*Ar
cSin[c + d*x])*Hypergeometric2F1[-1/4, 1/2, 3/4, (c + d*x)^2])/(3*d*e^2*Sqr
t[e*(c + d*x)]) + (16*b^2*Sqrt[e*(c + d*x)]*HypergeometricPFQ[{1/4, 1/4, 1}
, {3/4, 5/4}, (c + d*x)^2])/(3*d*e^3)
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{(ex)^{5/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2(a+b\arcsin(c+dx))^2}{3de(e(c+dx))^{3/2}} + \frac{(4b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{3/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{3de}\\
&= -\frac{2(a+b\arcsin(c+dx))^2}{3de(e(c+dx))^{3/2}}\\
&\quad - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)}{3de^2\sqrt{e(c+dx)}}\\
&\quad + \frac{16b^2\sqrt{e(c+dx)}\,{}_3F_2\left(\frac{1}{4},\frac{1}{4},1;\frac{3}{4},\frac{5}{4};(c+dx)^2\right)}{3de^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.78

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx =$$
$$-\frac{2\left((a+b\arcsin(c+dx))^2+4b(c+dx)\left((a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)-2\right.\right.}{3de(e(c+dx))^{3/2}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-2*((a + b*ArcSin[c + d*x])^2 + 4*b*(c + d*x)*((a + b*ArcSin[c + d*x])*Hyp
ergeometric2F1[-1/4, 1/2, 3/4, (c + d*x)^2] - 2*b*(c + d*x)*HypergeometricP
FQ[{1/4, 1/4, 1}, {3/4, 5/4}, (c + d*x)^2])))/(3*d*e*(e*(c + d*x))^(3/2))
```

Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x +
 c*e)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\,\text{asin}\,(c+dx))^2}{(e\,(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(5/2), x)
```

3.298 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{5de(e(c+dx))^{5/2}} - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)}{15de^2(e(c+dx))^{3/2}} - \frac{16b^2\,{}_3F_2\left(-\frac{1}{4},-\frac{1}{4},1;\frac{1}{4},\frac{3}{4};(c+dx)^2\right)}{15de^3\sqrt{e(c+dx)}}$$

```
[Out] -2/5*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(5/2)-8/15*b*(a+b*arcsin(d*x+c))
*hypergeom([-3/4, 1/2],[1/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(3/2)-16/15*b^2*h
ypergeom([-1/4, -1/4, 1],[1/4, 3/4],(d*x+c)^2)/d/e^3/(e*(d*x+c))^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = -\frac{16b^2\,{}_3F_2\left(-\frac{1}{4},-\frac{1}{4},1;\frac{1}{4},\frac{3}{4};(c+dx)^2\right)}{15de^3\sqrt{e(c+dx)}} - \frac{8b\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))^2}{5de(e(c+dx))^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(7/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^2)/(5*d*e*(e*(c + d*x))^(5/2)) - (8*b*(a + b*Ar
cSin[c + d*x])*Hypergeometric2F1[-3/4, 1/2, 1/4, (c + d*x)^2])/(15*d*e^2*(e
*(c + d*x))^(3/2)) - (16*b^2*HypergeometricPFQ[{-1/4, -1/4, 1}, {1/4, 3/4},
 (c + d*x)^2])/(15*d*e^3*Sqrt[e*(c + d*x)])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{(ex)^{7/2}}\,dx, x, c+dx\right)}{d}\\
&= -\frac{2(a+b\arcsin(c+dx))^2}{5de(e(c+dx))^{5/2}} + \frac{(4b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{5/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{5de}\\
&= -\frac{2(a+b\arcsin(c+dx))^2}{5de(e(c+dx))^{5/2}}\\
&\quad - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)}{15de^2(e(c+dx))^{3/2}}\\
&\quad - \frac{16b^2\,{}_3F_2\left(-\frac{1}{4},-\frac{1}{4},1;\frac{1}{4},\frac{3}{4};(c+dx)^2\right)}{15de^3\sqrt{e(c+dx)}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx =$$
$$-\frac{2\left((a+b\arcsin(c+dx))\left(3(a+b\arcsin(c+dx))+4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)\right)+\ldots\right)}{15de(e(c+dx))^{5/2}}$$

[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(7/2),x]

[Out] (-2*((a + b*ArcSin[c + d*x])*(3*(a + b*ArcSin[c + d*x]) + 4*b*(c + d*x)*Hypergeometric2F1[-3/4, 1/2, 1/4, (c + d*x)^2]) + 8*b^2*(c + d*x)^2*HypergeometricPFQ[{-1/4, -1/4, 1}, {1/4, 3/4}, (c + d*x)^2]))/(15*d*e*(e*(c + d*x))^(5/2))

Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{7}{2}}}dx$$

[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x)

[Out] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{7}{2}}}\,dx$$

[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="fricas")

[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x + c*e)/(d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*e^4), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^2}{(e(c+dx))^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(7/2),x)
[Out] Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(7/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{7}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(7/2),x)
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(7/2), x)
```

3.299 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{7de(e(c+dx))^{7/2}} - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)}{35de^2(e(c+dx))^{5/2}} - \frac{16b^2\,{}_3F_2\left(-\frac{3}{4},-\frac{3}{4},1;-\frac{1}{4},\frac{1}{4};(c+dx)^2\right)}{105de^3(e(c+dx))^{3/2}}$$

```
[Out] -2/7*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(7/2)-8/35*b*(a+b*arcsin(d*x+c))
*hypergeom([-5/4, 1/2],[-1/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(5/2)-16/105*b^2
*hypergeom([-3/4, -3/4, 1],[-1/4, 1/4],(d*x+c)^2)/d/e^3/(e*(d*x+c))^(3/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4889, 4723, 4805}

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = -\frac{16b^2\,{}_3F_2\left(-\frac{3}{4},-\frac{3}{4},1;-\frac{1}{4},\frac{1}{4};(c+dx)^2\right)}{105de^3(e(c+dx))^{3/2}} - \frac{8b\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{35de^2(e(c+dx))^{5/2}} - \frac{2(a+b\arcsin(c+dx))^2}{7de(e(c+dx))^{7/2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(9/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^2)/(7*d*e*(e*(c + d*x))^(7/2)) - (8*b*(a + b*Ar
cSin[c + d*x])*Hypergeometric2F1[-5/4, 1/2, -1/4, (c + d*x)^2])/(35*d*e^2*(
e*(c + d*x))^(5/2)) - (16*b^2*HypergeometricPFQ[{-3/4, -3/4, 1}, {-1/4, 1/4
}, (c + d*x)^2])/(105*d*e^3*(e*(c + d*x))^(3/2))
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{(ex)^{9/2}}\,dx, x, c+dx\right)}{d} \\
&= -\frac{2(a+b\arcsin(c+dx))^2}{7de(e(c+dx))^{7/2}} + \frac{(4b)\text{Subst}\left(\int \frac{a+b\arcsin(x)}{(ex)^{7/2}\sqrt{1-x^2}}\,dx, x, c+dx\right)}{7de} \\
&= -\frac{2(a+b\arcsin(c+dx))^2}{7de(e(c+dx))^{7/2}} \\
&\quad - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)}{35de^2(e(c+dx))^{5/2}} \\
&\quad - \frac{16b^2\,{}_3F_2\left(-\frac{3}{4},-\frac{3}{4},1;-\frac{1}{4},\frac{1}{4};(c+dx)^2\right)}{105de^3(e(c+dx))^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx =$$
$$-\frac{2\sqrt{e(c+dx)}\big(3(a+b\arcsin(c+dx))\left(5(a+b\arcsin(c+dx))+4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4}\right.\right.}{105de^5(c+dx)^4}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(9/2),x]
[Out] (-2*Sqrt[e*(c + d*x)]*(3*(a + b*ArcSin[c + d*x])*(5*(a + b*ArcSin[c + d*x])
 + 4*b*(c + d*x)*Hypergeometric2F1[-5/4, 1/2, -1/4, (c + d*x)^2]) + 8*b^2*(
c + d*x)^2*HypergeometricPFQ[{-3/4, -3/4, 1}, {-1/4, 1/4}, (c + d*x)^2]))/(
105*d*e^5*(c + d*x)^4)
```

Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{9}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x)
[Out] int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="fricas")
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x +
 c*e)/(d^5*e^5*x^5 + 5*c*d^4*e^5*x^4 + 10*c^2*d^3*e^5*x^3 + 10*c^3*d^2*e^5*
x^2 + 5*c^4*d*e^5*x + c^5*e^5), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(9/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{9}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(9/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{9/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(9/2),x)
[Out] int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(9/2), x)
```

3.300 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{3de}-\frac{2b\text{Int}\left(\frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] 2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^3/d/e-2*b*Unintegrable((e*(d*x+c)
)^(3/2)*(a+b*arcsin(d*x+c))^2/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx$$

```
[In] Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] (2*(e*(c + d*x))^(3/2)*(a + b*ArcSin[c + d*x])^3)/(3*d*e) - (2*b*Defer[Subs
t][Defer[Int][((e*x)^(3/2)*(a + b*ArcSin[x])^2)/Sqrt[1 - x^2], x], x, c + d
*x])/(d*e)
```

Rubi steps

$$\text{integral}=\frac{\text{Subst}\left(\int \sqrt{ex}(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}$$

$$=\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{3de}-\frac{(2b)\text{Subst}\left(\int \frac{(ex)^{3/2}(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de}$$

Mathematica [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\$\text{Aborted}$$

```
[In] Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^3,x]
[Out] $Aborted
```

Maple [N/A] (verified)

Not integrable

Time = 0.43 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \sqrt{dex+ce}\,(a+b\arcsin(dx+c))^3\,dx$$

```
[In] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x)
[Out] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.20

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^3\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)*sqrt(d*e*x + c*e), x)
```

Sympy [N/A]

Not integrable

Time = 70.92 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{e\,(c+dx)}(a+b\,\mathrm{asin}\,(c+dx))^3\;dx$$

```
[In] integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**3,x)
[Out] Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx = \int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^3\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^3, x)
```

Mupad [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx = \int \sqrt{c\,e+d\,e\,x}\,(a+b\,\mathrm{asin}(c+d\,x))^3\,dx$$

```
[In] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^3,x)
```

```
[Out] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^3, x)
```

3.301 $\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{de} - \frac{6b\text{Int}\left(\frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] 2*(a+b*arcsin(d*x+c))^3*(e*(d*x+c))^(1/2)/d/e-6*b*Unintegrable((a+b*arcsin(
d*x+c))^2*(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x],x]
```

```
[Out] (2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x])^3)/(d*e) - (6*b*Defer[Subst][D
efer[Int][(Sqrt[e*x]*(a + b*ArcSin[x])^2)/Sqrt[1 - x^2], x], x, c + d*x])/(
d*e)
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{\sqrt{ex}}\,dx,x,c+dx\right)}{d}$$

$$= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{de} - \frac{(6b)\text{Subst}\left(\int \frac{\sqrt{ex}(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de}$$

Mathematica [N/A]

Not integrable

Time = 91.05 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x],x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.11 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^3}{\sqrt{dex+ce}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x)
[Out] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.20

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{\sqrt{dex+ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)/sqrt(d*e*x + c*e), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(a + b \arcsin(c + dx))^3}{\sqrt{ce + dex}} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(1/2),x)
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a + b \arcsin(c + dx))^3}{\sqrt{ce + dex}} dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.84 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a + b \arcsin(c + dx))^3}{\sqrt{ce + dex}} dx = \int \frac{(b \arcsin(dx + c) + a)^3}{\sqrt{dex + ce}} dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/sqrt(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3}{\sqrt{c\,e+d\,e\,x}} \,d x$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(1/2),x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(1/2), x)
```

3.302 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^3}{de\sqrt{e(c+dx)}}+\frac{6b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^2}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] -2*(a+b*arcsin(d*x+c))^3/d/e/(e*(d*x+c))^(1/2)+6*b*Unintegrable((a+b*arcsin
(d*x+c))^2/(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^3)/(d*e*Sqrt[e*(c + d*x)]) + (6*b*Defer[Subst][
Defer[Int][(a + b*ArcSin[x])^2/(Sqrt[e*x]*Sqrt[1 - x^2]), x], x, c + d*x])/
(d*e)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{(ex)^{3/2}}\,dx,x,c+dx\right)}{d} \\
&= -\frac{2(a+b\arcsin(c+dx))^3}{de\sqrt{e(c+dx)}}+\frac{(6b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{\sqrt{ex}\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 49.63 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.30 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\left(a+b\arcsin\left(dx+c\right)\right)^{3}}{\left(dex+ce\right)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x)
[Out] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 3.32

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^{3}}{\left(dex+ce\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)*sqrt(d*e*x + c*e)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2),
x)
```

Sympy [N/A]

Not integrable

Time = 20.42 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}{(c+dx)})^3}{(e\,(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c + d*x))**3/(e*(c + d*x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.55 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin{(dx+c)}+a)^3}{(dex+ce)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3}{{\left(c\,e+d\,e\,x\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(3/2),x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(3/2), x)
```

3.303 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^3}{3de(e(c+dx))^{3/2}}+\frac{2b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] -2/3*(a+b*arcsin(d*x+c))^3/d/e/(e*(d*x+c))^(3/2)+2*b*Unintegrable((a+b*arcs
in(d*x+c))^2/(e*(d*x+c))^(3/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^3)/(3*d*e*(e*(c + d*x))^(3/2)) + (2*b*Defer[Sub
st][Defer[Int][(a + b*ArcSin[x])^2/((e*x)^(3/2)*Sqrt[1 - x^2]), x], x, c +
d*x])/(d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{(ex)^{5/2}}\,dx,x,c+dx\right)}{d}\\&=-\frac{2(a+b\arcsin(c+dx))^3}{3de(e(c+dx))^{3/2}}+\frac{(2b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{(ex)^{3/2}\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 45.15 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.53 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\left(a+b\arcsin\left(dx+c\right)\right)^{3}}{\left(dex+ce\right)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x)
[Out] int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 97, normalized size of antiderivative = 3.88

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^{3}}{\left(dex+ce\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)*sqrt(d*e*x + c*e)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*
d*e^3*x + c^3*e^3), x)
```

Sympy [N/A]

Not integrable

Time = 30.89 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^3}{(e(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(5/2),x)
[Out] Integral((a + b*asin(c + d*x))**3/(e*(c + d*x))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^(5/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}{\left(c\,e+d\,e\,x\right)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(5/2),x)
[Out] int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(5/2), x)
```

3.304 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^4}{3de} - \frac{8b\text{Int}\left(\frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{3e}$$

```
[Out] 2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^4/d/e-8/3*b*Unintegrable((e*(d*x+
c))^(3/2)*(a+b*arcsin(d*x+c))^3/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$$

```
[In] Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] (2*(e*(c + d*x))^(3/2)*(a + b*ArcSin[c + d*x])^4)/(3*d*e) - (8*b*Defer[Subs
t][Defer[Int][((e*x)^(3/2)*(a + b*ArcSin[x])^3)/Sqrt[1 - x^2], x], x, c + d
*x])/(3*d*e)
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \sqrt{ex}(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}$$

$$= \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^4}{3de} - \frac{(8b)\text{Subst}\left(\int \frac{(ex)^{3/2}(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3de}$$

Mathematica [N/A]

Not integrable

Time = 164.93 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$$

```
[In] Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4,x]
[Out] Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.39 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \sqrt{dex+ce}\,(a+b\arcsin(dx+c))^4\,dx$$

```
[In] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x)
[Out] int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x)
```

Fricas [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 71, normalized size of antiderivative = 2.84

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^4\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e), x)
```

Sympy [N/A]

Not integrable

Time = 73.33 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{e\,(c+dx)}(a+b\operatorname{asin}(c+dx))^4\,dx$$

```
[In] integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**4,x)
[Out] Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 1.75 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^4\,dx$$

```
[In] integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^4, x)
```

Mupad [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \int \sqrt{c\,e+d\,e\,x}\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

```
[In] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^4,x)
```

```
[Out] int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^4, x)
```

3.305 $\int \frac{(a+b \arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4}{de} - \frac{8b\mathrm{Int}\left(\frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] 2*(a+b*arcsin(d*x+c))^4*(e*(d*x+c))^(1/2)/d/e-8*b*Unintegrable((a+b*arcsin(
d*x+c))^3*(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x],x]
```

```
[Out] (2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x])^4)/(d*e) - (8*b*Defer[Subst][D
efer[Int][(Sqrt[e*x]*(a + b*ArcSin[x])^3)/Sqrt[1 - x^2], x], x, c + d*x])/(
d*e)
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{\sqrt{ex}}\,dx, x, c+dx\right)}{d}$$
$$= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4}{de} - \frac{(8b)\text{Subst}\left(\int \frac{\sqrt{ex}(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de}$$

Mathematica [N/A]

Not integrable

Time = 15.47 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x],x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.09 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^4}{\sqrt{dex+ce}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x)
[Out] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 2.84

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{\sqrt{dex+ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/sqrt(d*e*x + c*e), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(1/2),x)
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 1.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{\sqrt{dex+ce}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/sqrt(d*e*x + c*e), x)
```

Mupad [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{\sqrt{c\,e+d\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(1/2),x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(1/2), x)
```

3.306 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^4}{de\sqrt{e(c+dx)}}+\frac{8b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^3}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

```
[Out] -2*(a+b*arcsin(d*x+c))^4/d/e/(e*(d*x+c))^(1/2)+8*b*Unintegrable((a+b*arcsin
(d*x+c))^3/(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^4)/(d*e*Sqrt[e*(c + d*x)]) + (8*b*Defer[Subst][
Defer[Int][(a + b*ArcSin[x])^3/(Sqrt[e*x]*Sqrt[1 - x^2]), x], x, c + d*x])/
(d*e)
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{(ex)^{3/2}}\,dx,x,c+dx\right)}{d} \\ &= -\frac{2(a+b\arcsin(c+dx))^4}{de\sqrt{e(c+dx)}}+\frac{(8b)\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{\sqrt{ex}\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de} \end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 27.88 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.36 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\left(a+b\arcsin\left(dx+c\right)\right)^{4}}{\left(dex+ce\right)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x)
[Out] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 3.96

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^{4}}{\left(dex+ce\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e)/(d^2*e^2*
x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

Sympy [N/A]

Not integrable

Time = 26.31 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^4}{(e(c+dx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(3/2),x)
[Out] Integral((a + b*asin(c + d*x))**4/(e*(c + d*x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.73 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^4}{{\left(c\,e+d\,e\,x\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(3/2),x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(3/2), x)
```

3.307 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^4}{3de(e(c+dx))^{3/2}}+\frac{8b\mathrm{Int}\left(\frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}},x\right)}{3e}$$

```
[Out] -2/3*(a+b*arcsin(d*x+c))^4/d/e/(e*(d*x+c))^(3/2)+8/3*b*Unintegrable((a+b*ar
csin(d*x+c))^3/(e*(d*x+c))^(3/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2),x]
```

```
[Out] (-2*(a + b*ArcSin[c + d*x])^4)/(3*d*e*(e*(c + d*x))^(3/2)) + (8*b*Defer[Sub
st][Defer[Int][(a + b*ArcSin[x])^3/((e*x)^(3/2)*Sqrt[1 - x^2]), x], x, c +
d*x])/(3*d*e)
```

Rubi steps

$$\begin{aligned}\text{integral}&=\frac{\mathrm{Subst}\left(\int \frac{(a+b\arcsin(x))^4}{(ex)^{5/2}}\,dx,x,c+dx\right)}{d}\\&=-\frac{2(a+b\arcsin(c+dx))^4}{3de(e(c+dx))^{3/2}}+\frac{(8b)\mathrm{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{(ex)^{3/2}\sqrt{1-x^2}}\,dx,x,c+dx\right)}{3de}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 10.79 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2),x]
[Out] Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.80 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\left(a+b\arcsin\left(dx+c\right)\right)^{4}}{\left(dex+ce\right)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x)
[Out] int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 113, normalized size of antiderivative = 4.52

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{\left(b\arcsin\left(dx+c\right)+a\right)^{4}}{\left(dex+ce\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e)/(d^3*e^3*
x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

Sympy [N/A]

Not integrable

Time = 40.21 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^4}{(e(c+dx))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(5/2),x)
[Out] Integral((a + b*asin(c + d*x))**4/(e*(c + d*x))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^(5/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(5/2),x)
[Out] int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(5/2), x)
```

3.308 $\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^4}{de(1+m)}-\frac{4b\mathrm{Int}\left(\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{e(1+m)}$$

```
[Out] (e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^4/d/e/(1+m)-4*b*Unintegrable((e*(d*x+
c))^(1+m)*(a+b*arcsin(d*x+c))^3/(1-(d*x+c)^2)^(1/2),x)/e/(1+m)
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$$

```
[In] Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4,x]
```

```
[Out] ((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x])^4)/(d*e*(1 + m)) - (4*b*Defe
r[Subst][Defer[Int][((e*x)^(1 + m)*(a + b*ArcSin[x])^3)/Sqrt[1 - x^2], x],
x, c + d*x])/(d*e*(1 + m))
```

Rubi steps

$$\text{integral}=\frac{\mathrm{Subst}\left(\int (ex)^m(a+b\arcsin(x))^4\,dx,x,c+dx\right)}{d}$$

$$=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^4}{de(1+m)}-\frac{(4b)\mathrm{Subst}\left(\int \frac{(ex)^{1+m}(a+b\arcsin(x))^3}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de(1+m)}$$

Mathematica [N/A]

Not integrable

Time = 1.61 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$$

```
[In] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4,x]
[Out] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4, x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.30 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int (dex+ce)^m\,(a+b\arcsin\,(dx+c))^4\,dx$$

```
[In] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x)
[Out] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 3.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (b\arcsin\,(dx+c)+a)^4(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
[Out] integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arc
sin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*(d*e*x + c*e)^m, x)
```

Sympy [N/A]

Not integrable

Time = 52.55 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))^4\;dx$$

```
[In] integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**4,x)
[Out] Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**4, x)
```

Maxima [N/A]

Not integrable

Time = 10.10 (sec) , antiderivative size = 618, normalized size of antiderivative = 26.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (b\arcsin(dx+c)+a)^4(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] (d*e*x + c*e)^(m + 1)*a^4/(d*e*(m + 1)) + ((b^4*d*e^m*x + b^4*c*e^m)*(d*x +
 c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + (d*m + d)*
integrate(2*(2*(b^4*d*e^m*x + b^4*c*e^m)*sqrt(d*x + c + 1)*sqrt(-d*x - c +
1)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 2
*((a*b^3*c^2 - a*b^3)*e^m*m + (a*b^3*d^2*e^m*m + a*b^3*d^2*e^m)*x^2 + (a*b^
3*c^2 - a*b^3)*e^m + 2*(a*b^3*c*d*e^m*m + a*b^3*c*d*e^m)*x)*(d*x + c)^m*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 3*((a^2*b^2*c^2 - a
^2*b^2)*e^m*m + (a^2*b^2*d^2*e^m*m + a^2*b^2*d^2*e^m)*x^2 + (a^2*b^2*c^2 -
a^2*b^2)*e^m + 2*(a^2*b^2*c*d*e^m*m + a^2*b^2*c*d*e^m)*x)*(d*x + c)^m*arcta
n2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*((a^3*b*c^2 - a^3*b
)*e^m*m + (a^3*b*d^2*e^m*m + a^3*b*d^2*e^m)*x^2 + (a^3*b*c^2 - a^3*b)*e^m +
 2*(a^3*b*c*d*e^m*m + a^3*b*c*d*e^m)*x)*(d*x + c)^m*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1)))/((d^2*m + d^2)*x^2 + c^2 + (c^2 - 1)*m + 2
*(c*d*m + c*d)*x - 1), x))/(d*m + d)
```

Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (b\arcsin(dx+c)+a)^4(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^4*(d*e*x + c*e)^m, x)
```

Mupad [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)^m\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

```
[In] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^4,x)
[Out] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^4, x)
```

3.309 $\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^3}{de(1+m)}-\frac{3b\text{Int}\left(\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e(1+m)}$$

```
[Out] (e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^3/d/e/(1+m)-3*b*Unintegrable((e*(d*x+
c))^(1+m)*(a+b*arcsin(d*x+c))^2/(1-(d*x+c)^2)^(1/2),x)/e/(1+m)
```

Rubi [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx$$

```
[In] Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3,x]
```

```
[Out] ((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x])^3)/(d*e*(1 + m)) - (3*b*Defe
r[Subst][Defer[Int][((e*x)^(1 + m)*(a + b*ArcSin[x])^2)/Sqrt[1 - x^2], x],
x, c + d*x])/(d*e*(1 + m))
```

Rubi steps

$$\text{integral}=\frac{\text{Subst}\left(\int (ex)^m(a+b\arcsin(x))^3\,dx,x,c+dx\right)}{d}$$

$$=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^3}{de(1+m)}-\frac{(3b)\text{Subst}\left(\int\frac{(ex)^{1+m}(a+b\arcsin(x))^2}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de(1+m)}$$

Mathematica [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx$$

```
[In] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3,x]
[Out] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3, x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.17 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int (dex+ce)^m\,(a+b\arcsin\,(dx+c))^3\,dx$$

```
[In] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x)
[Out] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.39

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (b\arcsin\,(dx+c)+a)^3(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
[Out] integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsi
n(d*x + c) + a^3)*(d*e*x + c*e)^m, x)
```

Sympy [N/A]

Not integrable

Time = 20.49 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))^3\,dx$$

```
[In] integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**3,x)
[Out] Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**3, x)
```

Maxima [N/A]

Not integrable

Time = 7.43 (sec) , antiderivative size = 469, normalized size of antiderivative = 20.39

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx = \int (b\arcsin\left(dx+c\right)+a)^3(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] (d*e*x + c*e)^(m + 1)*a^3/(d*e*(m + 1)) + ((b^3*d*e^m*x + b^3*c*e^m)*(d*x +
 c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + (d*m + d)*
integrate(3*((b^3*d*e^m*x + b^3*c*e^m)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)
*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + ((a
*b^2*c^2 - a*b^2)*e^m*m + (a*b^2*d^2*e^m*m + a*b^2*d^2*e^m)*x^2 + (a*b^2*c^
2 - a*b^2)*e^m + 2*(a*b^2*c*d*e^m*m + a*b^2*c*d*e^m)*x)*(d*x + c)^m*arctan2
(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + ((a^2*b*c^2 - a^2*b)*e^
m*m + (a^2*b*d^2*e^m*m + a^2*b*d^2*e^m)*x^2 + (a^2*b*c^2 - a^2*b)*e^m + 2*(
a^2*b*c*d*e^m*m + a^2*b*c*d*e^m)*x)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x +
 c + 1)*sqrt(-d*x - c + 1)))/((d^2*m + d^2)*x^2 + c^2 + (c^2 - 1)*m + 2*(c*
d*m + c*d)*x - 1), x))/(d*m + d)
```

Giac [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx = \int (b\arcsin\left(dx+c\right)+a)^3(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x + c) + a)^3*(d*e*x + c*e)^m, x)
```

Mupad [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx = \int {\left(c\,e+d\,e\,x\right)}^m\,{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^3 \,d x$$

```
[In] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^3,x)
```

```
[Out] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^3, x)
```

3.310 $\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 183

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx = \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{de(1+m)} - \frac{2b(e(c+dx))^{2+m}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)} + \frac{2b^2(e(c+dx))^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};(c+dx)^2\right)}{de^3(1+m)(2+m)(3+m)}$$

```
[Out] (e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^2/d/e/(1+m)-2*b*(e*(d*x+c))^(2+m)*(a+
b*arcsin(d*x+c))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],(d*x+c)^2)/d/e^2/(1+m)/
(2+m)+2*b^2*(e*(d*x+c))^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m,
 5/2+1/2*m],(d*x+c)^2)/d/e^3/(3+m)/(m^2+3*m+2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used

$= \{4889, 4723, 4805\}$

$$\int (ce + dex)^m (a + b \arcsin(c + dx))^2 \, dx$$
$$= \frac{2b^2 (e(c+dx))^{m+3} \, {}_3F_2\left(1, \frac{m}{2} + \frac{3}{2}, \frac{m}{2} + \frac{3}{2}; \frac{m}{2} + 2, \frac{m}{2} + \frac{5}{2}; (c+dx)^2\right)}{de^3 (m+1)(m+2)(m+3)}$$
$$- \frac{2b (e(c+dx))^{m+2} \, \text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{m+2}{2}, \frac{m+4}{2}, (c+dx)^2\right) (a + b \arcsin(c+dx))}{de^2 (m+1)(m+2)}$$
$$+ \frac{(e(c+dx))^{m+1} (a + b \arcsin(c+dx))^2}{de(m+1)}$$

```
[In] Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] ((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x])^2)/(d*e*(1 + m)) - (2*b*(e*(
c + d*x))^(2 + m)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, (2 + m)/2,
 (4 + m)/2, (c + d*x)^2])/(d*e^2*(1 + m)*(2 + m)) + (2*b^2*(e*(c + d*x))^(3
 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, (c
 + d*x)^2])/(d*e^3*(1 + m)*(2 + m)*(3 + m))
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (ex)^m(a+b\arcsin(x))^2\,dx,x,c+dx\right)}{d}$$

$$= \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{de(1+m)} - \frac{(2b)\text{Subst}\left(\int \frac{(ex)^{1+m}(a+b\arcsin(x))}{\sqrt{1-x^2}}\,dx,x,c+dx\right)}{de(1+m)}$$

$$= \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{de(1+m)} - \frac{2b(e(c+dx))^{2+m}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)} + \frac{2b^2(e(c+dx))^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};(c+dx)^2\right)}{de^3(1+m)(2+m)(3+m)}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.83

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx = \frac{(c+dx)(e(c+dx))^m\left((a+b\arcsin(c+dx))^2-\frac{2b(c+dx)(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{2+m}+\right.}{d(1+m)}$$

```
[In] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^2,x]
```

```
[Out] ((c + d*x)*(e*(c + d*x))^m*((a + b*ArcSin[c + d*x])^2 - (2*b*(c + d*x)*(a +
 b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x)^
2])/(2 + m) + (2*b^2*(c + d*x)^2*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2
}, {2 + m/2, 5/2 + m/2}, (c + d*x)^2])/((2 + m)*(3 + m))))/(d*(1 + m))
```

Maple [F]

$$\int (dex+ce)^m\,(a+b\arcsin(dx+c))^2\,dx$$

```
[In] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x)
```

```
[Out] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x)
```

Fricas [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin{(dx+c)}+a)^2(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*(d*e*x + c*e
)^m, x)
```

Sympy [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))^2\,\,dx$$

```
[In] integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**2,x)
```

```
[Out] Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**2, x)
```

Maxima [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin{(dx+c)}+a)^2(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] ((b^2*d*e^m*x + b^2*c*e^m)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*s
qrt(-d*x - c + 1))^2 + (d*m + d)*integrate(2*((b^2*d*e^m*x + b^2*c*e^m)*sqr
t(d*x + c + 1)*sqrt(-d*x - c + 1)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c
 + 1)*sqrt(-d*x - c + 1)) + ((a*b*c^2 - a*b)*e^m*m + (a*b*d^2*e^m*m + a*b*d
^2*e^m)*x^2 + (a*b*c^2 - a*b)*e^m + 2*(a*b*c*d*e^m*m + a*b*c*d*e^m)*x)*(d*x
 + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/((d^2*m + d
^2)*x^2 + c^2 + (c^2 - 1)*m + 2*(c*d*m + c*d)*x - 1), x))/(d*m + d) + (d*e*
x + c*e)^(m + 1)*a^2/(d*e*(m + 1))
```

Giac [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin(dx+c)+a)^2(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)^2*(d*e*x + c*e)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^m\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^2\,dx$$

```
[In] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^2,x)
[Out] int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^2, x)
```

3.311 $\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 89

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))}{de(1+m)} - \frac{b(e(c+dx))^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)}$$

```
[Out] (e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))/d/e/(1+m)-b*(e*(d*x+c))^(2+m)*hyperge
om([1/2, 1+1/2*m],[2+1/2*m],(d*x+c)^2)/d/e^2/(1+m)/(2+m)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {4889, 4723, 371}

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))}{de(m+1)} - \frac{b(e(c+dx))^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},(c+dx)^2\right)}{de^2(m+1)(m+2)}$$

```
[In] Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] ((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x]))/(d*e*(1 + m)) - (b*(e*(c +
d*x))^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x)^2])/(d
*e^2*(1 + m)*(2 + m))
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int (ex)^m(a+b\arcsin(x))\,dx, x, c+dx\right)}{d}\\ &= \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))}{de(1+m)} - \frac{b\text{Subst}\left(\int \frac{(ex)^{1+m}}{\sqrt{1-x^2}}\,dx, x, c+dx\right)}{de(1+m)}\\ &= \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))}{de(1+m)}\\ &\quad - \frac{b(e(c+dx))^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = -\frac{(c+dx)(e(c+dx))^m\left(-((2+m)(a+b\arcsin(c+dx)))+b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2}\right.\right.}{d(1+m)(2+m)}$$

```
[In] Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x]),x]
```

```
[Out] -(((c + d*x)*(e*(c + d*x))^m*(-((2 + m)*(a + b*ArcSin[c + d*x])) + b*(c + d
*x)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x)^2]))/(d*(1 + m)*
(2 + m)))
```

Maple [F]

$$\int (dex+ce)^m (a+b\arcsin{(dx+c)})\,dx$$

```
[In] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x)
```

```
[Out] int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x)
```

Fricas [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \int (b\arcsin{(dx+c)}+a)(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(d*x + c) + a)*(d*e*x + c*e)^m, x)
```

Sympy [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \int (e(c+dx))^m\,(a+b\operatorname{asin}{(c+dx)})\,\,dx$$

```
[In] integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c)),x)
```

```
[Out] Integral((e*(c + d*x))**m*(a + b*asin(c + d*x)), x)
```

Maxima [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \int (b\arcsin{(dx+c)}+a)(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

```
[Out] ((d*e^m*x + c*e^m)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
 - c + 1)) + (d*m + d)*integrate((d*e^m*x + c*e^m)*sqrt(d*x + c + 1)*sqrt(-
d*x - c + 1)*(d*x + c)^m/((d^2*m + d^2)*x^2 + c^2 + (c^2 - 1)*m + 2*(c*d*m
+ c*d)*x - 1), x))*b/(d*m + d) + (d*e*x + c*e)^(m + 1)*a/(d*e*(m + 1))
```

Giac [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx=\int (b\arcsin(dx+c)+a)(dex+ce)^m\,dx$$

```
[In] integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x + c) + a)*(d*e*x + c*e)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^m\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

```
[In] int((c*e + d*e*x)^m*(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)^m*(a + b*asin(c + d*x)), x)
```

3.312 $\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx = \mathrm{Int}\left(\frac{(e(c+dx))^m}{a+b\arcsin(c+dx)},x\right)$$

```
[Out] Unintegrable((e*(d*x+c))^m/(a+b*arcsin(d*x+c)),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx = \int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$$

```
[In] Int[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]),x]
```

```
[Out] Defer[Subst][Defer[Int][(e*x)^m/(a + b*ArcSin[x]), x], x, c + d*x]/d
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(ex)^m}{a+b\arcsin(x)}\,dx, x, c+dx\right)}{d}$$

Mathematica [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$$

```
[In] Integrate[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]),x]
[Out] Integrate[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 4.29 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{(dex+ce)^m}{a+b\arcsin(dx+c)}dx$$

```
[In] int((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x)
[Out] int((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^m}{b\arcsin(dx+c)+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
[Out] integral((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

Sympy [N/A]

Not integrable

Time = 1.02 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.83

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(e(c+dx))^m}{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$

```
[In] integrate((d*e*x+c*e)**m/(a+b*asin(d*x+c)),x)
[Out] Integral((e*(c + d*x))**m/(a + b*asin(c + d*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^m}{b\arcsin{(dx+c)}+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
[Out] integrate((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

Giac [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^m}{b\arcsin{(dx+c)}+a}\,dx$$

```
[In] integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="giac")
[Out] integrate((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^m}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

```
[In] int((c*e + d*e*x)^m/(a + b*asin(c + d*x)),x)
[Out] int((c*e + d*e*x)^m/(a + b*asin(c + d*x)), x)
```

3.313 $\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 135

$$\begin{aligned}\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx &= \frac{3(a+bx)^2}{8b} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{4b} \\ &\quad + \frac{3\arcsin(a+bx)^2}{8b} - \frac{3(a+bx)^2\arcsin(a+bx)^2}{4b} \\ &\quad + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b} + \frac{\arcsin(a+bx)^4}{8b}\end{aligned}$$

```
[Out] 3/8*(b*x+a)^2/b+3/8*arcsin(b*x+a)^2/b-3/4*(b*x+a)^2*arcsin(b*x+a)^2/b+1/8*a
rcsin(b*x+a)^4/b-3/4*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b+1/2*(b*x+a
)*arcsin(b*x+a)^3*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4891, 4741, 4737, 4723, 4795, 30}

$$\begin{aligned}\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx &= \frac{\arcsin(a+bx)^4}{8b} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b} - \frac{3(a+bx)^2\arcsin(a+bx)^2}{4b} \\ &\quad + \frac{3\arcsin(a+bx)^2}{8b} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{4b} + \frac{3(a+bx)^2}{8b}\end{aligned}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3,x]
```

```
[Out] (3*(a + b*x)^2)/(8*b) - (3*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])
/(4*b) + (3*ArcSin[a + b*x]^2)/(8*b) - (3*(a + b*x)^2*ArcSin[a + b*x]^2)/(4
*b) + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^3)/(2*b) + ArcSin[a
+ b*x]^4/(8*b)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)^3\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b}\\
&\quad+\frac{\text{Subst}\left(\int \frac{\arcsin(x)^3}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b}-\frac{3\text{Subst}\left(\int x\arcsin(x)^2\,dx, x, a+bx\right)}{2b}\\
&= -\frac{3(a+bx)^2\arcsin(a+bx)^2}{4b}+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b}\\
&\quad+\frac{\arcsin(a+bx)^4}{8b}+\frac{3\text{Subst}\left(\int \frac{x^2\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b}\\
&= -\frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{4b}-\frac{3(a+bx)^2\arcsin(a+bx)^2}{4b}\\
&\quad+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b}+\frac{\arcsin(a+bx)^4}{8b}\\
&\quad+\frac{3\text{Subst}\left(\int x\,dx, x, a+bx\right)}{4b}+\frac{3\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{4b}\\
&= \frac{3(a+bx)^2}{8b}-\frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{4b}\\
&\quad+\frac{3\arcsin(a+bx)^2}{8b}-\frac{3(a+bx)^2\arcsin(a+bx)^2}{4b}\\
&\quad+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b}+\frac{\arcsin(a+bx)^4}{8b}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.99

$$
\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx
$$

$$
=\frac{3bx(2a+bx)-6(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)-3(-1+2a^2+4abx+2b^2x^2)\arcsin(a+}{8b}
$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3,x]
[Out] (3*b*x*(2*a + b*x) - 6*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a
 + b*x] - 3*(-1 + 2*a^2 + 4*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x]^2 + 4*(a + b
*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3 + ArcSin[a + b*x]^4
)/(8*b)
```

Maple [A] (verified)

Time = 1.85 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.59

method	result
default	$\frac{4 \arcsin(bx+a)^{3} \sqrt{-b^{2}x^{2}-2abx-a^{2}+1}\, bx-6 \arcsin(bx+a)^{2} b^{2}x^{2}+4 \arcsin(bx+a)^{3} \sqrt{-b^{2}x^{2}-2abx-a^{2}+1}\, a-12 \arcsin(bx+a)^{2} abx+\arcsin}{}$

```
[In] int(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*(4*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-6*arcsin(b*x+a)^2
*b^2*x^2+4*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-12*arcsin(b*x+a
)^2*a*b*x+arcsin(b*x+a)^4-6*arcsin(b*x+a)^2*a^2-6*arcsin(b*x+a)*(-b^2*x^2-2
*a*b*x-a^2+1)^(1/2)*b*x+3*b^2*x^2-6*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^
(1/2)*a+6*a*b*x+3*arcsin(b*x+a)^2+3*a^2)/b
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.81

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx = \frac{3 \, b^{2}x^{2} + \arcsin\left(bx+a\right)^{4} + 6 \, abx - 3 \, \left(2 \, b^{2}x^{2} + 4 \, abx + 2 \, a^{2} - 1\right) \arcsin\left(bx+a\right)^{2} + 2 \, \sqrt{-b^{2}x^{2} - 2 \, abx - a^{2}}}{8 \, b}$$

```
[In] integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fric
as")
```

```
[Out] 1/8*(3*b^2*x^2 + arcsin(b*x + a)^4 + 6*a*b*x - 3*(2*b^2*x^2 + 4*a*b*x + 2*a
^2 - 1)*arcsin(b*x + a)^2 + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(b*x +
a)*arcsin(b*x + a)^3 - 3*(b*x + a)*arcsin(b*x + a)))/b
```

Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx = \int \sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)} \operatorname{asin}^{3}\left(a+bx\right) dx$$

```
[In] integrate(asin(b*x+a)**3*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

```
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x)**3, x)
```

Maxima [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx = \int \sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin\left(bx+a\right)^3\,dx$$

```
[In] integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^3, x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.20

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx = \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^3}{2\,b} + \frac{\arcsin\left(bx+a\right)^4}{8\,b} - \frac{3\,(b^2x^2+2\,abx+a^2-1)\arcsin\left(bx+a\right)^2}{4\,b} - \frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)}{4\,b} - \frac{3\,\arcsin\left(bx+a\right)^2}{8\,b} + \frac{3\,(b^2x^2+2\,abx+a^2-1)}{8\,b} + \frac{3}{16\,b}$$

```
[In] integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac
")
```

```
[Out] 1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^3/b + 1/8*
arcsin(b*x + a)^4/b - 3/4*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)^2/b
 - 3/4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b - 3/8
*arcsin(b*x + a)^2/b + 3/8*(b^2*x^2 + 2*a*b*x + a^2 - 1)/b + 3/16/b
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx=\int \operatorname{asin}(a+b\,x)^3\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

```
[In] int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
[Out] int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

3.314 $\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 111

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx = -\frac{(a+bx)\sqrt{1-(a+bx)^2}}{4b} + \frac{\arcsin(a+bx)}{4b} - \frac{(a+bx)^2 \arcsin(a+bx)}{2b} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b} + \frac{\arcsin(a+bx)^3}{6b}$$

```
[Out] 1/4*arcsin(b*x+a)/b-1/2*(b*x+a)^2*arcsin(b*x+a)/b+1/6*arcsin(b*x+a)^3/b-1/4
*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b+1/2*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1
/2)/b
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4891, 4741, 4737, 4723, 327, 222}

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx = \frac{\arcsin(a+bx)^3}{6b} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b} - \frac{(a+bx)^2 \arcsin(a+bx)}{2b} + \frac{\arcsin(a+bx)}{4b} - \frac{(a+bx)\sqrt{1-(a+bx)^2}}{4b}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2,x]
```

```
[Out] -1/4*((a + b*x)*Sqrt[1 - (a + b*x)^2])/b + ArcSin[a + b*x]/(4*b) - ((a + b*
x)^2*ArcSin[a + b*x])/(2*b) + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b
*x]^2)/(2*b) + ArcSin[a + b*x]^3/(6*b)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
```

```
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)^2\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b}\\
&\quad + \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b} - \frac{\text{Subst}\left(\int x\arcsin(x)\,dx, x, a+bx\right)}{b}\\
&= -\frac{(a+bx)^2\arcsin(a+bx)}{2b} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b}\\
&\quad + \frac{\arcsin(a+bx)^3}{6b} + \frac{\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b}\\
&= -\frac{(a+bx)\sqrt{1-(a+bx)^2}}{4b} - \frac{(a+bx)^2\arcsin(a+bx)}{2b}\\
&\quad + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b}\\
&\quad + \frac{\arcsin(a+bx)^3}{6b} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{4b}\\
&= -\frac{(a+bx)\sqrt{1-(a+bx)^2}}{4b} + \frac{\arcsin(a+bx)}{4b} - \frac{(a+bx)^2\arcsin(a+bx)}{2b}\\
&\quad + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b} + \frac{\arcsin(a+bx)^3}{6b}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.05

$$
\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx
$$
$$
= \frac{-3(a+bx)\sqrt{1-a^2-2abx-b^2x^2} - 3(-1+2a^2+4abx+2b^2x^2)\arcsin(a+bx) + 6(a+bx)\sqrt{1-a^2-2}}{12b}
$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2,x]
[Out] (-3*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] - 3*(-1 + 2*a^2 + 4*a*b*x +
 2*b^2*x^2)*ArcSin[a + b*x] + 6*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]
*ArcSin[a + b*x]^2 + 2*ArcSin[a + b*x]^3)/(12*b)
```

Maple [A] (verified)

Time = 1.75 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.61

method	result
default	$\frac{6 \arcsin(bx+a)^2 \sqrt{-b^2x^2-2abx-a^2+1}\, bx-6 \arcsin(bx+a) b^2x^2+6 \arcsin(bx+a)^2 \sqrt{-b^2x^2-2abx-a^2+1}\, a-12 \arcsin(bx+a) abx+2 \operatorname{arcsi}}{12b}$

```
[In] int(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/12*(6*arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-6*arcsin(b*x+a)*
b^2*x^2+6*arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-12*arcsin(b*x+a)
*a*b*x+2*arcsin(b*x+a)^3-6*a^2*arcsin(b*x+a)-3*x*b*(-b^2*x^2-2*a*b*x-a^2+1)
^(1/2)-3*a*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+3*arcsin(b*x+a))/b
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.82

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$$
$$= \frac{2 \arcsin(bx+a)^3 - 3(2b^2x^2+4abx+2a^2-1)\arcsin(bx+a) + 3\sqrt{-b^2x^2-2abx-a^2+1}(2(bx+a)\,\mathrm{a}}{12b}$$

```
[In] integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fric
as")
```

```
[Out] 1/12*(2*arcsin(b*x + a)^3 - 3*(2*b^2*x^2 + 4*a*b*x + 2*a^2 - 1)*arcsin(b*x
+ a) + 3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(b*x + a)*arcsin(b*x + a)^2
- b*x - a))/b
```

Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$$
$$= \int \sqrt{-(a+bx-1)(a+bx+1)} \operatorname{asin}^2(a+bx) \, dx$$

```
[In] integrate(asin(b*x+a)**2*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

```
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x)**2, x)
```

Maxima [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx$$
$$=\int \sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin\left(bx+a\right)^2\,dx$$

```
[In] integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^2, x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.13

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx$$
$$=\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^2}{2\,b}$$
$$+\frac{\arcsin\left(bx+a\right)^3}{6\,b}-\frac{(b^2x^2+2\,abx+a^2-1)\arcsin\left(bx+a\right)}{2\,b}$$
$$-\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{4\,b}-\frac{\arcsin\left(bx+a\right)}{4\,b}$$

```
[In] integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac
")
```

```
[Out] 1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b + 1/6*
arcsin(b*x + a)^3/b - 1/2*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)/b -
 1/4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)/b - 1/4*arcsin(b*x + a)/b
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx=\int \mathrm{asin}(a+b\,x)^2\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

```
[In] int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

```
[Out] int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

3.315 $\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 63

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = -\frac{(a+bx)^2}{4b}+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b}+\frac{\arcsin(a+bx)^2}{4b}$$

```
[Out] -1/4*(b*x+a)^2/b+1/4*arcsin(b*x+a)^2/b+1/2*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)
^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {4891, 4741, 4737, 30}

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \frac{\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)}{2b}+\frac{\arcsin(a+bx)^2}{4b}-\frac{(a+bx)^2}{4b}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x],x]
```

```
[Out] -1/4*(a + b*x)^2/b + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/(2*b
) + ArcSin[a + b*x]^2/(4*b)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)\,dx, x, a+bx\right)}{b}\\ &= \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b}\\ &\quad -\frac{\text{Subst}\left(\int x\,dx, x, a+bx\right)}{2b}+\frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{2b}\\ &= -\frac{(a+bx)^2}{4b}+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b}+\frac{\arcsin(a+bx)^2}{4b}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.02

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \frac{-bx(2a+bx)+2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)+\arcsin(a+bx)^2}{4b}$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x],x]
[Out] (-(b*x*(2*a + b*x)) + 2*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[
a + b*x] + ArcSin[a + b*x]^2)/(4*b)
```

Maple [A] (verified)

Time = 1.50 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.52

method	result	size
default	$\frac{2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,bx-b^2x^2+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a-2abx+\arcsin(bx+a)^2-a^2}{4b}$	96

[In] int(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/4*(2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-b^2*x^2+2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-2*a*b*x+arcsin(b*x+a)^2-a^2)/b

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = -\frac{b^2x^2+2\,abx-2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)-\arcsin\left(bx+a\right)^2}{4\,b}$$

[In] integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fricas")

[Out] -1/4*(b^2*x^2 + 2*a*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a) - arcsin(b*x + a)^2)/b

Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \int \sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}\,\mathrm{asin}\left(a+bx\right)dx$$

[In] integrate(asin(b*x+a)*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)

[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x), x)

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 240 vs. 2(55) = 110.

Time = 0.31 (sec) , antiderivative size = 240, normalized size of antiderivative = 3.81

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = -\frac{1}{4}\left(x^2+\frac{2\,ax}{b}-\frac{2\,\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^2}-\frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{b^2}\right)b -\frac{1}{2}\left(\frac{a^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b}-\sqrt{-b^2x^2-2\,abx-a^2+1}x-\frac{(a^2-1)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b}-\ \cdots +a\right)$$

```
[In] integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/4*(x^2 + 2*a*x/b - 2*arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2
- (a^2 - 1)*b^2))/b^2 - arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2)
)^2/b^2)*b - 1/2*(a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/
b - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x - (a^2 - 1)*arcsin(-(b^2*x + a*b)/
sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a/b)*
arcsin(b*x + a)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.25

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)}{2\,b} + \frac{\arcsin\left(bx+a\right)^2}{4\,b}-\frac{b^2x^2+2\,abx+a^2-1}{4\,b}-\frac{1}{8\,b}$$

```
[In] integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b + 1/4*ar
csin(b*x + a)^2/b - 1/4*(b^2*x^2 + 2*a*b*x + a^2 - 1)/b - 1/8/b
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \int \operatorname{asin}(a+b\,x)\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

```
[In] int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
[Out] int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

3.316 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 31

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx=\frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b}+\frac{\log(\arcsin(a+bx))}{2b}$$

```
[Out] 1/2*Ci(2*arcsin(b*x+a))/b+1/2*ln(arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {4891, 4753, 3393, 3383}

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx=\frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b}+\frac{\log(\arcsin(a+bx))}{2b}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x],x]
[Out] CosIntegral[2*ArcSin[a + b*x]]/(2*b) + Log[ArcSin[a + b*x]]/(2*b)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)}\,dx, x, a+bx\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}+\frac{\cos(2x)}{2x}\right)\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\log(\arcsin(a+bx))}{2b}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b}\\
&= \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b}+\frac{\log(\arcsin(a+bx))}{2b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.77

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))+\log(\arcsin(a+bx))}{2b}$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x],x]
[Out] (CosIntegral[2*ArcSin[a + b*x]] + Log[ArcSin[a + b*x]])/(2*b)
```

Maple [A] (verified)

Time = 1.79 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.74

method	result	size
default	$\frac{\ln(\arcsin(bx+a))+\mathrm{Ci}(2\arcsin(bx+a))}{2b}$	23

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] 1/2*(ln(arcsin(b*x+a))+Ci(2*arcsin(b*x+a)))/b
```

Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx=\int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="fricas
")
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a), x)
```

Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx=\int \frac{\sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}}{\operatorname{asin}\left(a+bx\right)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a),x)
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x), x)
```

Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx=\int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="maxima
")
[Out] integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.87

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \frac{\mathrm{Ci}\left(2\arcsin\left(bx+a\right)\right)}{2\,b} + \frac{\log\left(\arcsin\left(bx+a\right)\right)}{2\,b}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="giac")
[Out] 1/2*cos_integral(2*arcsin(b*x + a))/b + 1/2*log(arcsin(b*x + a))/b
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x),x)
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x), x)
```

3.317 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 39

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx=-\frac{1-(a+bx)^2}{b\arcsin(a+bx)}-\frac{\mathrm{Si}(2\arcsin(a+bx))}{b}$$

```
[Out] (-1+(b*x+a)^2)/b/arcsin(b*x+a)-Si(2*arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4891, 4751, 4731, 4491, 12, 3380}

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx=-\frac{\mathrm{Si}(2\arcsin(a+bx))}{b}-\frac{1-(a+bx)^2}{b\arcsin(a+bx)}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^2,x]
[Out] -((1 - (a + b*x)^2)/(b*ArcSin[a + b*x])) - SinIntegral[2*ArcSin[a + b*x]]/b
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{x}{\arcsin(x)}\,dx, x, a+bx\right)}{b}\\
&= -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{\text{Si}(2\arcsin(a+bx))}{b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.18

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \frac{-1+a^2+2abx+b^2x^2-\arcsin(a+bx)\text{Si}(2\arcsin(a+bx))}{b\arcsin(a+bx)}$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^2,x]
```

```
[Out] (-1 + a^2 + 2*a*b*x + b^2*x^2 - ArcSin[a + b*x]*SinIntegral[2*ArcSin[a + b*
x]])/(b*ArcSin[a + b*x])
```

Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.08

method	result	size
default	$-\frac{2\ \text{Si}(2\arcsin(bx+a))\arcsin(bx+a)+\cos(2\arcsin(bx+a))+1}{2b\arcsin(bx+a)}$	42

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/b*(2*Si(2*arcsin(b*x+a))*arcsin(b*x+a)+cos(2*arcsin(b*x+a))+1)/arcsin(
b*x+a)
```

Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="fric
as")
```

```
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^2, x)
```

Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-(a+bx-1)(a+bx+1)}}{\operatorname{asin}^2(a+bx)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**2,x)
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**2, x)
```

Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin(bx+a)^2}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="maxi
ma")
[Out] (b^2*x^2 + 2*a*b*x - b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1
))*integrate(2*(b*x + a)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a +
 1)), x) + a^2 - 1)/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1
)))
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.13

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = -\frac{\operatorname{Si}(2\arcsin(bx+a))}{b} + \frac{b^2x^2+2\,abx+a^2-1}{b\arcsin(bx+a)}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="giac
")
[Out] -sin_integral(2*arcsin(b*x + a))/b + (b^2*x^2 + 2*a*b*x + a^2 - 1)/(b*arcsi
n(b*x + a))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)^2}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^2,x)
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^2, x)
```

3.318 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx$

Optimal result

Integrand size = 33, antiderivative size = 71

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx = \frac{-1+(a+bx)^2}{2b\arcsin(a+bx)^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b}$$

```
[Out] 1/2*(-1+(b*x+a)^2)/b/arcsin(b*x+a)^2-Ci(2*arcsin(b*x+a))/b+(b*x+a)*(1-(b*x+
a)^2)^(1/2)/b/arcsin(b*x+a)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {4891, 4751, 4727, 3383}

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx = -\frac{\text{CosIntegral}(2\arcsin(a+bx))}{b} + \frac{\sqrt{1-(a+bx)^2}(a+bx)}{b\arcsin(a+bx)} - \frac{1-(a+bx)^2}{2b\arcsin(a+bx)^2}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^3,x]
```

```
[Out] -1/2*(1 - (a + b*x)^2)/(b*ArcSin[a + b*x]^2) + ((a + b*x)*Sqrt[1 - (a + b*x
)^2])/(b*ArcSin[a + b*x]) - CosIntegral[2*ArcSin[a + b*x]]/b
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b} \\
&= -\frac{1-(a+bx)^2}{2b\arcsin(a+bx)^2} - \frac{\text{Subst}\left(\int \frac{x}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b} \\
&= -\frac{1-(a+bx)^2}{2b\arcsin(a+bx)^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{1-(a+bx)^2}{2b\arcsin(a+bx)^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.24

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx$$
$$= \frac{-1+a^2+2abx+b^2x^2+2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)-2\arcsin(a+bx)^2\,\mathrm{CosIntegral}(}{2b\arcsin(a+bx)^2}$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^3,x]
```

```
[Out] (-1 + a^2 + 2*a*b*x + b^2*x^2 + 2*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^
2]*ArcSin[a + b*x] - 2*ArcSin[a + b*x]^2*CosIntegral[2*ArcSin[a + b*x]])/(2
*b*ArcSin[a + b*x]^2)
```

Maple [A] (verified)

Time = 1.74 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.86

method	result	size
default	$-\frac{4\ \mathrm{Ci}(2\arcsin(bx+a))\arcsin(bx+a)^2-2\sin(2\arcsin(bx+a))\arcsin(bx+a)+\cos(2\arcsin(bx+a))+1}{4b\arcsin(bx+a)^2}$	61

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/b*(4*Ci(2*arcsin(b*x+a))*arcsin(b*x+a)^2-2*sin(2*arcsin(b*x+a))*arcsin
(b*x+a)+cos(2*arcsin(b*x+a))+1)/arcsin(b*x+a)^2
```

Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^3, x)
```

Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-(a+bx-1)(a+bx+1)}}{\operatorname{asin}^3(a+bx)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**3,x)
```

```
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**3, x)
```

Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin(bx+a)^3}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/2*(b^2*x^2 - 2*b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2
*integrate((2*b^2*x^2 + 4*a*b*x + 2*a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x -
a + 1)/((b^2*x^2 + 2*a*b*x + a^2 - 1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sq
rt(-b*x - a + 1))), x) + 2*a*b*x + 2*sqrt(b*x + a + 1)*(b*x + a)*sqrt(-b*x
- a + 1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) + a^2 - 1)/
(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.18

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = -\frac{\operatorname{Ci}(2\arcsin(bx+a))}{b} + \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{b\arcsin(bx+a)} + \frac{b^2x^2+2\,abx+a^2-1}{2\,b\arcsin(bx+a)^2}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] -cos_integral(2*arcsin(b*x + a))/b + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*
x + a)/(b*arcsin(b*x + a)) + 1/2*(b^2*x^2 + 2*a*b*x + a^2 - 1)/(b*arcsin(b*
x + a)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^3,x)
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^3, x)
```

3.319 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4} dx$

Optimal result

Integrand size = 33, antiderivative size = 115

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4} dx = -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{2\text{Si}(2\arcsin(a+bx))}{3b}$$

```
[Out] 1/3*(-1+(b*x+a)^2)/b/arcsin(b*x+a)^3+1/3/b/arcsin(b*x+a)-2/3*(b*x+a)^2/b/ar
csin(b*x+a)+2/3*Si(2*arcsin(b*x+a))/b+1/3*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b/arc
sin(b*x+a)^2
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4891, 4751, 4729, 4807, 4731, 4491, 12, 3380, 4737}

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4} dx = \frac{2\text{Si}(2\arcsin(a+bx))}{3b} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{\sqrt{1-(a+bx)^2}(a+bx)}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3}$$

```
[In] Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^4,x]
```

```
[Out] -1/3*(1 - (a + b*x)^2)/(b*ArcSin[a + b*x]^3) + ((a + b*x)*Sqrt[1 - (a + b*x
)^2])/(3*b*ArcSin[a + b*x]^2) + 1/(3*b*ArcSin[a + b*x]) - (2*(a + b*x)^2)/(
3*b*ArcSin[a + b*x]) + (2*SinIntegral[2*ArcSin[a + b*x]])/(3*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4729

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Dis
t[c*((m + 1)/(b*(n + 1))), Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[
1 - c^2*x^2]), x], x] - Dist[m/(b*c*(n + 1)), Int[x^(m - 1)*((a + b*ArcSin[
c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[m,
 0] && LtQ[n, -2]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
```

```
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)^4}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} - \frac{2\text{Subst}\left(\int \frac{x}{\arcsin(x)^3}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} - \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{3b} + \frac{2\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{x}{\arcsin(x)}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{2\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b}$$

$$= -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2} + \frac{1}{3b\arcsin(a+bx)} - \frac{2(a+bx)^2}{3b\arcsin(a+bx)} + \frac{2\text{Si}(2\arcsin(a+bx))}{3b}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.02

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \frac{-1+a^2+2abx+b^2x^2+(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)-(-1+2a^2+4abx+2b^2x^2)\arcs}{3b\arcsin(a+bx)^3}$$

```
[In] Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^4,x]
```

```
[Out] (-1 + a^2 + 2*a*b*x + b^2*x^2 + (a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]
*ArcSin[a + b*x] - (-1 + 2*a^2 + 4*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x]^2 + 2
*ArcSin[a + b*x]^3*SinIntegral[2*ArcSin[a + b*x]])/(3*b*ArcSin[a + b*x]^3)
```

Maple [A] (verified)

Time = 1.71 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.70

method	result
default	$\frac{4\,\text{Si}(2\arcsin(bx+a))\arcsin(bx+a)^3+2\cos(2\arcsin(bx+a))\arcsin(bx+a)^2+\sin(2\arcsin(bx+a))\arcsin(bx+a)-\cos(2\arcsin(bx+a))-1}{6b\arcsin(bx+a)^3}$

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6/b*(4*Si(2*arcsin(b*x+a))*arcsin(b*x+a)^3+2*cos(2*arcsin(b*x+a))*arcsin(
b*x+a)^2+sin(2*arcsin(b*x+a))*arcsin(b*x+a)-cos(2*arcsin(b*x+a))-1)/arcsin(
b*x+a)^3
```

Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^4}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="fric
as")
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^4, x)
```

Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \int \frac{\sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}}{\operatorname{asin}^4\left(a+bx\right)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**4,x)
[Out] Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**4, x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \text{Timed out}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="maxi
ma")
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.11

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \frac{2\,\operatorname{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{3\,b} - \frac{2\,\left(b^2x^2+2\,abx+a^2-1\right)}{3\,b\arcsin\left(bx+a\right)} + \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{3\,b\arcsin\left(bx+a\right)^2} - \frac{1}{3\,b\arcsin\left(bx+a\right)} + \frac{b^2x^2+2\,abx+a^2-1}{3\,b\arcsin\left(bx+a\right)^3}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] 2/3*sin_integral(2*arcsin(b*x + a))/b - 2/3*(b^2*x^2 + 2*a*b*x + a^2 - 1)/(
b*arcsin(b*x + a)) + 1/3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)/(b*ar
csin(b*x + a)^2) - 1/3/(b*arcsin(b*x + a)) + 1/3*(b^2*x^2 + 2*a*b*x + a^2 -
 1)/(b*arcsin(b*x + a)^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx=\int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{{\mathrm{asin}\left(a+b\,x\right)}^4}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^4,x)
```

```
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^4, x)
```

3.320 $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^3 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 245

$$\begin{aligned}\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^3 \, dx &= \frac{51(a+bx)^2}{128b} \\ &- \frac{3(a+bx)^4}{128b} - \frac{45(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{64b} \\ &- \frac{3(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{32b} + \frac{27\arcsin(a+bx)^2}{128b} \\ &- \frac{9(a+bx)^2\arcsin(a+bx)^2}{16b} + \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} \\ &+ \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} \\ &+ \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} + \frac{3\arcsin(a+bx)^4}{32b}\end{aligned}$$

```
[Out] 51/128*(b*x+a)^2/b-3/128*(b*x+a)^4/b-3/32*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcsi
n(b*x+a)/b+27/128*arcsin(b*x+a)^2/b-9/16*(b*x+a)^2*arcsin(b*x+a)^2/b+3/16*(
1-(b*x+a)^2)^2*arcsin(b*x+a)^2/b+1/4*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcsin(b*x
+a)^3/b+3/32*arcsin(b*x+a)^4/b-45/64*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1
/2)/b+3/8*(b*x+a)*arcsin(b*x+a)^3*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4891, 4743, 4741, 4737, 4723, 4795, 30, 4767, 14}

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = -\frac{9(a+bx)^2\arcsin(a+bx)^2}{16b}+\frac{\left(1-(a+bx)^2\right)^{3/2}(a+bx)\arcsin(a+bx)^3}{4b}+\frac{3\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)^3}{8b}-\frac{3\left(1-(a+bx)^2\right)^{3/2}(a+bx)\arcsin(a+bx)}{32b}-\frac{45\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)}{64b}+\frac{3\arcsin(a+bx)^4}{32b}+\frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b}+\frac{27\arcsin(a+bx)^2}{128b}-\frac{3(a+bx)^4}{128b}+\frac{51(a+bx)^2}{128b}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^3,x]
```

```
[Out] (51*(a + b*x)^2)/(128*b) - (3*(a + b*x)^4)/(128*b) - (45*(a + b*x)*Sqrt[1 -
 (a + b*x)^2]*ArcSin[a + b*x])/(64*b) - (3*(a + b*x)*(1 - (a + b*x)^2)^(3/2
)*ArcSin[a + b*x])/(32*b) + (27*ArcSin[a + b*x]^2)/(128*b) - (9*(a + b*x)^2
*ArcSin[a + b*x]^2)/(16*b) + (3*(1 - (a + b*x)^2)^2*ArcSin[a + b*x]^2)/(16*
b) + (3*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^3)/(8*b) + ((a + b*
x)*(1 - (a + b*x)^2)^(3/2)*ArcSin[a + b*x]^3)/(4*b) + (3*ArcSin[a + b*x]^4)
/(32*b)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (1-x^2)^{3/2}\arcsin(x)^3\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} - \frac{3\text{Subst}\left(\int x(1-x^2)\arcsin(x)^2\,dx, x, a+bx\right)}{4b} + \frac{3\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)^3\,dx, x, a+bx\right)}{4b}\\
&= \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} - \frac{3\text{Subst}\left(\int (1-x^2)^{3/2}\arcsin(x)\,dx, x, a+bx\right)}{8b} + \frac{3\text{Subst}\left(\int \frac{\arcsin(x)^3}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{8b} - \frac{9\text{Subst}\left(\int x\arcsin(x)^2\,dx, x, a+bx\right)}{8b}\\
&= -\frac{3(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{32b} - \frac{9(a+bx)^2\arcsin(a+bx)^2}{16b} + \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} + \frac{3\arcsin(a+bx)^4}{32b} + \frac{3\text{Subst}\left(\int x(1-x^2)\,dx, x, a+bx\right)}{32b} - \frac{9\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)\,dx, x, a+bx\right)}{32b} + \frac{9\text{Subst}\left(\int \frac{x^2\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{8b}
\end{aligned}$$

$$= -\frac{45(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{64b} - \frac{3(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{32b} - \frac{9(a+bx)^2\arcsin(a+bx)^2}{16b} + \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} + \frac{3\arcsin(a+bx)^4}{32b} + \frac{3\text{Subst}\left(\int(x-x^3)\,dx,x,a+bx\right)}{32b} + \frac{9\text{Subst}\left(\int x\,dx,x,a+bx\right)}{64b} - \frac{9\text{Subst}\left(\int\frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{64b} + \frac{9\text{Subst}\left(\int x\,dx,x,a+bx\right)}{16b} + \frac{9\text{Subst}\left(\int\frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{16b}$$

$$= \frac{51(a+bx)^2}{128b} - \frac{3(a+bx)^4}{128b} - \frac{45(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{64b} - \frac{3(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{32b} + \frac{27\arcsin(a+bx)^2}{128b} - \frac{9(a+bx)^2\arcsin(a+bx)^2}{16b} + \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} + \frac{3\arcsin(a+bx)^4}{32b}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.11

$$\int\left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \frac{6a(17-2a^2)\,bx+3(17-6a^2)\,b^2x^2-12ab^3x^3-3b^4x^4+6\sqrt{1-a^2-2abx-b^2x^2}(-17a+2a^3-}{}$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^3,x]
[Out] (6*a*(17 - 2*a^2)*b*x + 3*(17 - 6*a^2)*b^2*x^2 - 12*a*b^3*x^3 - 3*b^4*x^4 +
 6*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-17*a + 2*a^3 - 17*b*x + 6*a^2*b*x +
6*a*b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x] + 3*(17 + 8*a^4 + 32*a^3*b*x - 40*
b^2*x^2 + 8*b^4*x^4 + 16*a*b*x*(-5 + 2*b^2*x^2) + 8*a^2*(-5 + 6*b^2*x^2))*A
rcSin[a + b*x]^2 - 16*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3 - 5*b
*x + 6*a^2*b*x + 6*a*b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x]^3 + 12*ArcSin[a +
 b*x]^4)/(128*b)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 627 vs. $2(217) = 434$.

Time = 2.60 (sec) , antiderivative size = 628, normalized size of antiderivative = 2.56

method	result
default	$\frac{-75+408abx+204a^2+96\arcsin(bx+a)^2b^4x^4-128\arcsin(bx+a)^3\sqrt{-b^2x^2-2abx-a^2+1}\,a^3+48\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a^3-}{}$

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/512*(-75+408*a*b*x+204*a^2+96*arcsin(b*x+a)^2*b^4*x^4-128*arcsin(b*x+a)^3
*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3+48*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+
1)^(1/2)*a^3-12*b^4*x^4-480*arcsin(b*x+a)^2*a^2+204*b^2*x^2-12*a^4+48*arcsi
n(b*x+a)^4-384*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2-384
*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b*x+144*arcsin(b*x+a)*(
-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2+144*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x
-a^2+1)^(1/2)*a^2*b*x-48*a*b^3*x^3-72*a^2*b^2*x^2-48*a^3*b*x+384*arcsin(b*x
+a)^2*a*b^3*x^3+576*arcsin(b*x+a)^2*a^2*b^2*x^2+384*arcsin(b*x+a)^2*a^3*b*x
-128*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+48*arcsin(b*x+a
)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3-480*arcsin(b*x+a)^2*b^2*x^2+320*ar
csin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-408*arcsin(b*x+a)*(-b^2*x^2-
2*a*b*x-a^2+1)^(1/2)*a+320*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b
*x-960*arcsin(b*x+a)^2*a*b*x-408*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/
2)*b*x+204*arcsin(b*x+a)^2+96*arcsin(b*x+a)^2*a^4)/b
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.99

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx =$$

$$-\frac{3\,b^4x^4+12\,ab^3x^3+3\,(6\,a^2-17)b^2x^2-12\,\arcsin\left(bx+a\right)^4+6\,(2\,a^3-17\,a)bx-3\,(8\,b^4x^4+32\,ab^3x^3+8\,(6}{}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] -1/128*(3*b^4*x^4 + 12*a*b^3*x^3 + 3*(6*a^2 - 17)*b^2*x^2 - 12*arcsin(b*x +
 a)^4 + 6*(2*a^3 - 17*a)*b*x - 3*(8*b^4*x^4 + 32*a*b^3*x^3 + 8*(6*a^2 - 5)*
b^2*x^2 + 8*a^4 + 16*(2*a^3 - 5*a)*b*x - 40*a^2 + 17)*arcsin(b*x + a)^2 + 2
*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(8*(2*b^3*x^3 + 6*a*b^2*x^2 + 2*a^3 + (
6*a^2 - 5)*b*x - 5*a)*arcsin(b*x + a)^3 - 3*(2*b^3*x^3 + 6*a*b^2*x^2 + 2*a^
3 + (6*a^2 - 17)*b*x - 17*a)*arcsin(b*x + a)))/b
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 694 vs. $2(223) = 446$.

Time = 1.28 (sec) , antiderivative size = 694, normalized size of antiderivative = 2.83

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \begin{cases} \frac{3a^4\operatorname{asin}^2(a+bx)}{16b}+\frac{3a^3x\operatorname{asin}^2(a+bx)}{4}-\frac{3a^3x}{32}-\frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^3(a+bx)}{4b}+\frac{3a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a \\ x(1-a^2)^{\frac{3}{2}}\operatorname{asin}^3(a) \end{cases}$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a)**3,x)
```

```
[Out] Piecewise((3*a**4*asin(a + b*x)**2/(16*b) + 3*a**3*x*asin(a + b*x)**2/4 - 3
*a**3*x/32 - a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/(4
*b) + 3*a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(32*b) + 9
*a**2*b*x**2*asin(a + b*x)**2/8 - 9*a**2*b*x**2/64 - 3*a**2*x*sqrt(-a**2 -
2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/4 + 9*a**2*x*sqrt(-a**2 - 2*a*b*x
 - b**2*x**2 + 1)*asin(a + b*x)/32 - 15*a**2*asin(a + b*x)**2/(16*b) + 3*a*
b**2*x**3*asin(a + b*x)**2/4 - 3*a*b**2*x**3/32 - 3*a*b*x**2*sqrt(-a**2 - 2
*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/4 + 9*a*b*x**2*sqrt(-a**2 - 2*a*b*
x - b**2*x**2 + 1)*asin(a + b*x)/32 - 15*a*x*asin(a + b*x)**2/8 + 51*a*x/64
 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/(8*b) - 51*a*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(64*b) + 3*b**3*x**4*as
in(a + b*x)**2/16 - 3*b**3*x**4/128 - b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2
*x**2 + 1)*asin(a + b*x)**3/4 + 3*b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**
2 + 1)*asin(a + b*x)/32 - 15*b*x**2*asin(a + b*x)**2/16 + 51*b*x**2/128 + 5
*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/8 - 51*x*sqrt(-a*
*2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/64 + 3*asin(a + b*x)**4/(32*b)
+ 51*asin(a + b*x)**2/(128*b), Ne(b, 0)), (x*(1 - a**2)**(3/2)*asin(a)**3,
True))
```

Maxima [F]

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \int \left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^3\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^3, x)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.21

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)^3}{4\,b} + \frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^3}{8\,b} + \frac{3\left(b^2x^2+2\,abx+a^2-1\right)^2\arcsin\left(bx+a\right)^2}{16\,b} + \frac{3\,\arcsin\left(bx+a\right)^4}{32\,b} - \frac{3\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)}{32\,b} - \frac{9\left(b^2x^2+2\,abx+a^2-1\right)\arcsin\left(bx+a\right)^2}{16\,b} - \frac{45\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)}{64\,b} - \frac{3\left(b^2x^2+2\,abx+a^2-1\right)^2}{128\,b} - \frac{45\,\arcsin\left(bx+a\right)^2}{128\,b} + \frac{45\left(b^2x^2+2\,abx+a^2-1\right)}{128\,b} + \frac{189}{1024\,b}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] 1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)^3/b + 3/
8*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^3/b + 3/16*(
b^2*x^2 + 2*a*b*x + a^2 - 1)^2*arcsin(b*x + a)^2/b + 3/32*arcsin(b*x + a)^4
/b - 3/32*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)/b
- 9/16*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)^2/b - 45/64*sqrt(-b^2*
x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b - 3/128*(b^2*x^2 + 2*a
*b*x + a^2 - 1)^2/b - 45/128*arcsin(b*x + a)^2/b + 45/128*(b^2*x^2 + 2*a*b*
x + a^2 - 1)/b + 189/1024/b
```

Mupad [F(-1)]

Timed out.

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx=\int \operatorname{asin}(a+b\,x)^3\,\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}\,dx$$

```
[In] int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
[Out] int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.321 $\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 199

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^2\,dx = -\frac{15(a+bx)\sqrt{1-(a+bx)^2}}{64b} - \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} + \frac{9\arcsin(a+bx)}{64b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} + \frac{\arcsin(a+bx)^3}{8b}$$

```
[Out] -1/32*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b+9/64*arcsin(b*x+a)/b-3/8*(b*x+a)^2*arcs
in(b*x+a)/b+1/8*(1-(b*x+a)^2)^2*arcsin(b*x+a)/b+1/4*(b*x+a)*(1-(b*x+a)^2)^(
3/2)*arcsin(b*x+a)^2/b+1/8*arcsin(b*x+a)^3/b-15/64*(b*x+a)*(1-(b*x+a)^2)^(1
/2)/b+3/8*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used

= {4891, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^2\,dx = \frac{\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2} \arcsin(a+bx)^2}{4b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{9\arcsin(a+bx)}{64b} - \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} - \frac{15(a+bx)\sqrt{1-(a+bx)^2}}{64b}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2,x]
```

```
[Out] (-15*(a + b*x)*Sqrt[1 - (a + b*x)^2])/(64*b) - ((a + b*x)*(1 - (a + b*x)^2)
^(3/2))/(32*b) + (9*ArcSin[a + b*x])/(64*b) - (3*(a + b*x)^2*ArcSin[a + b*x
])/(8*b) + ((1 - (a + b*x)^2)^2*ArcSin[a + b*x])/(8*b) + (3*(a + b*x)*Sqrt[
1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(8*b) + ((a + b*x)*(1 - (a + b*x)^2)^(3
/2)*ArcSin[a + b*x]^2)/(4*b) + ArcSin[a + b*x]^3/(8*b)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (1-x^2)^{3/2} \arcsin(x)^2 \, dx, x, a+bx\right)}{b}$$

$$= \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} - \frac{\text{Subst}\left(\int x(1-x^2)\arcsin(x)\,dx,x,a+bx\right)}{2b} + \frac{3\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)^2\,dx,x,a+bx\right)}{4b}$$

$$= \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} - \frac{\text{Subst}\left(\int (1-x^2)^{3/2}\,dx,x,a+bx\right)}{8b} + \frac{3\text{Subst}\left(\int \frac{\arcsin(x)^2}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{8b} - \frac{3\text{Subst}\left(\int x\arcsin(x)\,dx,x,a+bx\right)}{4b}$$

$$= -\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} + \frac{\arcsin(a+bx)^3}{8b} - \frac{3\text{Subst}\left(\int \sqrt{1-x^2}\,dx,x,a+bx\right)}{32b} + \frac{3\text{Subst}\left(\int \frac{x^2}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{8b}$$

$$= -\frac{15(a+bx)\sqrt{1-(a+bx)^2}}{64b} - \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} + \frac{\arcsin(a+bx)^3}{8b} - \frac{3\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{64b} + \frac{3\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx,x,a+bx\right)}{16b}$$

$$= -\frac{15(a+bx)\sqrt{1-(a+bx)^2}}{64b} - \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} + \frac{9\arcsin(a+bx)}{64b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} + \frac{\arcsin(a+bx)^3}{8b}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.09

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2\,dx = \frac{\sqrt{1-a^2-2abx-b^2x^2}(-17a+2a^3-17bx+6a^2bx+6ab^2x^2+2b^3x^3)+(17-40a^2+8a^4)\arcsin$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2,x]
```

```
[Out] (Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-17*a + 2*a^3 - 17*b*x + 6*a^2*b*x + 6*
a*b^2*x^2 + 2*b^3*x^3) + (17 - 40*a^2 + 8*a^4)*ArcSin[a + b*x] + 8*b*x*(-10
*a + 4*a^3 - 5*b*x + 6*a^2*b*x + 4*a*b^2*x^2 + b^3*x^3)*ArcSin[a + b*x] - 8
*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3 - 5*b*x + 6*a^2*b*x + 6*a*
b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x]^2 + 8*ArcSin[a + b*x]^3)/(64*b)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 514 vs. 2(175) = 350.

Time = 2.62 (sec) , antiderivative size = 515, normalized size of antiderivative = 2.59

method	result
default	$\frac{-16\sqrt{-b^2x^2-2abx-a^2+1}\ \arcsin(bx+a)^2b^3x^3+8\arcsin(bx+a)b^4x^4-48\sqrt{-b^2x^2-2abx-a^2+1}\ \arcsin(bx+a)^2a\,b^2x^2+32\arcsin(bx+a)a}{}$

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/64*(-16*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*b^3*x^3+8*arcsin(b
*x+a)*b^4*x^4-48*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*a*b^2*x^2+3
2*arcsin(b*x+a)*a*b^3*x^3-48*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2
*a^2*b*x+2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+48*arcsin(b*x+a)*a^2*b^2*
x^2-16*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*a^3+6*(-b^2*x^2-2*a*b
*x-a^2+1)^(1/2)*a*b^2*x^2+32*arcsin(b*x+a)*a^3*b*x+40*arcsin(b*x+a)^2*(-b^2
*x^2-2*a*b*x-a^2+1)^(1/2)*b*x+6*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b*x+8*ar
csin(b*x+a)*a^4-40*arcsin(b*x+a)*b^2*x^2+40*arcsin(b*x+a)^2*(-b^2*x^2-2*a*b
*x-a^2+1)^(1/2)*a+2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3-80*arcsin(b*x+a)*a*b
*x-17*x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+8*arcsin(b*x+a)^3-40*a^2*arcsin(b*
x+a)-17*a*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+17*arcsin(b*x+a))/b
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.93

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx = \frac{8\,\arcsin\left(bx+a\right)^3+\left(8\,b^4x^4+32\,ab^3x^3+8\,(6\,a^2-5)b^2x^2+8\,a^4+16\,(2\,a^3-5\,a)bx-40\,a^2+17\right.}{}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="fric
as")
[Out] 1/64*(8*arcsin(b*x + a)^3 + (8*b^4*x^4 + 32*a*b^3*x^3 + 8*(6*a^2 - 5)*b^2*x
^2 + 8*a^4 + 16*(2*a^3 - 5*a)*b*x - 40*a^2 + 17)*arcsin(b*x + a) + (2*b^3*x
^3 + 6*a*b^2*x^2 + 2*a^3 + (6*a^2 - 17)*b*x - 8*(2*b^3*x^3 + 6*a*b^2*x^2 +
2*a^3 + (6*a^2 - 5)*b*x - 5*a)*arcsin(b*x + a)^2 - 17*a)*sqrt(-b^2*x^2 - 2*
a*b*x - a^2 + 1))/b
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 568 vs. 2(175) = 350.

Time = 0.90 (sec) , antiderivative size = 568, normalized size of antiderivative = 2.85

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx = \begin{cases} \frac{a^4\operatorname{asin}(a+bx)}{8b}+\frac{a^3x\operatorname{asin}(a+bx)}{2}-\frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{4b}+\frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}}{32b}+\frac{3a^2bx^2\operatorname{asin}(a+bx)}{4} \\ x(1-a^2)^{\frac{3}{2}}\operatorname{asin}^2(a) \end{cases}$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a)**2,x)
[Out] Piecewise((a**4*asin(a + b*x)/(8*b) + a**3*x*asin(a + b*x)/2 - a**3*sqrt(-a
**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(4*b) + a**3*sqrt(-a**2 - 2
*a*b*x - b**2*x**2 + 1)/(32*b) + 3*a**2*b*x**2*asin(a + b*x)/4 - 3*a**2*x*s
qrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/4 + 3*a**2*x*sqrt(-a*
*2 - 2*a*b*x - b**2*x**2 + 1)/32 - 5*a**2*asin(a + b*x)/(8*b) + a*b**2*x**3
*asin(a + b*x)/2 - 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a
+ b*x)**2/4 + 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/32 - 5*a*x*a
sin(a + b*x)/4 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2
/(8*b) - 17*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(64*b) + b**3*x**4*asin
(a + b*x)/8 - b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)
**2/4 + b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/32 - 5*b*x**2*asin(
a + b*x)/8 + 5*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/8 -
 17*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/64 + asin(a + b*x)**3/(8*b) + 1
7*asin(a + b*x)/(64*b), Ne(b, 0)), (x*(1 - a**2)**(3/2)*asin(a)**2, True))
```

Maxima [F]

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2\,dx=\int \left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="maxi
ma")
```

```
[Out] integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^2, x)
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.14

$$\begin{aligned}\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2\,dx &= \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)^2}{4\,b} \\ &+ \frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^2}{8\,b} \\ &+ \frac{\left(b^2x^2+2\,abx+a^2-1\right)^2\arcsin\left(bx+a\right)}{8\,b}+\frac{\arcsin\left(bx+a\right)^3}{8\,b} \\ &- \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)}{32\,b}-\frac{3\left(b^2x^2+2\,abx+a^2-1\right)\arcsin\left(bx+a\right)}{8\,b} \\ &- \frac{15\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{64\,b}-\frac{15\,\arcsin\left(bx+a\right)}{64\,b}\end{aligned}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] 1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)^2/b + 3/
8*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b + 1/8*(b
^2*x^2 + 2*a*b*x + a^2 - 1)^2*arcsin(b*x + a)/b + 1/8*arcsin(b*x + a)^3/b -
 1/32*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/b - 3/8*(b^2*x^2 + 2*a
*b*x + a^2 - 1)*arcsin(b*x + a)/b - 15/64*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
)*(b*x + a)/b - 15/64*arcsin(b*x + a)/b
```

Mupad [F(-1)]

Timed out.

$$\int \left(1 - a^2 - 2abx - b^2x^2\right)^{3/2} \arcsin(a + bx)^2 \, dx = \int \operatorname{asin}(a + b\,x)^2 \left(-a^2 - 2\,a\,b\,x - b^2\,x^2 + 1\right)^{3/2} dx$$

```
[In] int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
[Out] int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.322 $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)\,dx$

Optimal result

Integrand size = 31, antiderivative size = 110

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\,dx = -\frac{5(a+bx)^2}{16b} + \frac{(a+bx)^4}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{4b} + \frac{3\arcsin(a+bx)^2}{16b}$$

```
[Out] -5/16*(b*x+a)^2/b+1/16*(b*x+a)^4/b+1/4*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcsin(b
*x+a)/b+3/16*arcsin(b*x+a)^2/b+3/8*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2
)/b
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {4891, 4743, 4741, 4737, 30, 14}

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\,dx = \frac{\left(1-(a+bx)^2\right)^{3/2}(a+bx)\arcsin(a+bx)}{4b} + \frac{3\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)}{8b} + \frac{3\arcsin(a+bx)^2}{16b} + \frac{(a+bx)^4}{16b} - \frac{5(a+bx)^2}{16b}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x],x]
```

```
[Out] (-5*(a + b*x)^2)/(16*b) + (a + b*x)^4/(16*b) + (3*(a + b*x)*Sqrt[1 - (a + b
*x)^2]*ArcSin[a + b*x])/(8*b) + ((a + b*x)*(1 - (a + b*x)^2)^(3/2)*ArcSin[a
 + b*x])/(4*b) + (3*ArcSin[a + b*x]^2)/(16*b)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (1-x^2)^{3/2}\arcsin(x)\,dx, x, a+bx\right)}{b}$$

$$= \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{4b} - \frac{\text{Subst}\left(\int x(1-x^2)\,dx, x, a+bx\right)}{4b} + \frac{3\text{Subst}\left(\int \sqrt{1-x^2}\arcsin(x)\,dx, x, a+bx\right)}{4b}$$

$$= \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{4b} - \frac{\text{Subst}\left(\int (x-x^3)\,dx, x, a+bx\right)}{4b} - \frac{3\text{Subst}\left(\int x\,dx, x, a+bx\right)}{8b} + \frac{3\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{8b}$$

$$= -\frac{5(a+bx)^2}{16b} + \frac{(a+bx)^4}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{4b} + \frac{3\arcsin(a+bx)^2}{16b}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.17

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)\,dx = \frac{1}{16}\left(2a\left(-5+2a^2\right)x + \left(-5+6a^2\right)bx^2 + 4ab^2x^3 + b^3x^4 - \frac{2\sqrt{1-a^2-2abx-b^2x^2}\left(-5a+2a^3-5bx+6a^2bx+6ab^2x^2+2b^3x^3\right)\arcsin(a+bx)}{b} + \frac{3\arcsin(a+bx)^2}{b}\right)$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x],x]
```

```
[Out] (2*a*(-5 + 2*a^2)*x + (-5 + 6*a^2)*b*x^2 + 4*a*b^2*x^3 + b^3*x^4 - (2*Sqrt[
1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3 - 5*b*x + 6*a^2*b*x + 6*a*b^2*x^
2 + 2*b^3*x^3)*ArcSin[a + b*x])/b + (3*ArcSin[a + b*x]^2)/b)/16
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 279 vs. 2(96) = 192.

Time = 1.99 (sec) , antiderivative size = 280, normalized size of antiderivative = 2.55

method	result
default	$\frac{-16 \arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\, b^3x^3+4b^4x^4-48 \arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\, a\, b^2x^2+16a\, b^3x^3-48 \arcsin(bx+a)\sqrt{-}}{}$

[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x,method=_RETURNVERBOSE)

[Out] 1/64*(-16*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+4*b^4*x^4-48*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2+16*a*b^3*x^3-48*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b*x+24*a^2*b^2*x^2-16*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3+16*a^3*b*x+40*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x+4*a^4-20*b^2*x^2+40*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-40*a*b*x+12*arcsin(b*x+a)^2-20*a^2+25)/b

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.14

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\, dx = \frac{b^4x^4+4\,ab^3x^3+(6\,a^2-5)b^2x^2+2\,(2\,a^3-5\,a)bx-2\,(2\,b^3x^3+6\,ab^2x^2+2\,a^3+(6\,a^2-5)bx-5}{16\,b}$$

[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="fricas")

[Out] 1/16*(b^4*x^4 + 4*a*b^3*x^3 + (6*a^2 - 5)*b^2*x^2 + 2*(2*a^3 - 5*a)*b*x - 2*(2*b^3*x^3 + 6*a*b^2*x^2 + 2*a^3 + (6*a^2 - 5)*b*x - 5*a)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a) + 3*arcsin(b*x + a)^2)/b

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 298 vs. 2(95) = 190.

Time = 0.62 (sec) , antiderivative size = 298, normalized size of antiderivative = 2.71

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\, dx = \begin{cases} \frac{a^3x}{4} - \frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{4b} + \frac{3a^2bx^2}{8} - \frac{3a^2x\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{4} + \frac{ab^2x^3}{4} - \frac{3abx^2\sqrt{-a^2-2}}{} \\ x(1-a^2)^{\frac{3}{2}}\operatorname{asin}(a) \end{cases}$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a),x)
```

```
[Out] Piecewise((a**3*x/4 - a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b
*x)/(4*b) + 3*a**2*b*x**2/8 - 3*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1
)*asin(a + b*x)/4 + a*b**2*x**3/4 - 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b**2*
x**2 + 1)*asin(a + b*x)/4 - 5*a*x/8 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2
+ 1)*asin(a + b*x)/(8*b) + b**3*x**4/16 - b**2*x**3*sqrt(-a**2 - 2*a*b*x -
b**2*x**2 + 1)*asin(a + b*x)/4 - 5*b*x**2/16 + 5*x*sqrt(-a**2 - 2*a*b*x - b
**2*x**2 + 1)*asin(a + b*x)/8 + 3*asin(a + b*x)**2/(16*b), Ne(b, 0)), (x*(1
 - a**2)**(3/2)*asin(a), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 402 vs. $2(96) = 192$.

Time = 0.30 (sec) , antiderivative size = 402, normalized size of antiderivative = 3.65

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)\,dx=\frac{1}{16}\left(b^2x^4+4\,abx^3+6\,a^2x^2+\frac{4\,a^3x}{b}-5\,x^2-\frac{10\,ax}{b}+\frac{6\,\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^2}+\dots\right.$$
$$+\frac{1}{8}\left(2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}x+\frac{2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}a}{b}-\frac{3\left(a^2b^2-(a^2-1)b^2\right)a^2\arcsin\left(-\frac{b\dots}{\sqrt{a^2b\dots}}\right.}{b^3}\dots\right.$$
$$+a)$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="maxima
")
```

```
[Out] 1/16*(b^2*x^4 + 4*a*b*x^3 + 6*a^2*x^2 + 4*a^3*x/b - 5*x^2 - 10*a*x/b + 6*ar
csin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^2 + 3*
arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b^2)*b + 1/8*(2*(-b^
2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*x + 2*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)
*a/b - 3*(a^2*b^2 - (a^2 - 1)*b^2)*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 -
 (a^2 - 1)*b^2))/b^3 + 3*(a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x
- a^2 + 1)*x/b^2 + 3*(a^2*b^2 - (a^2 - 1)*b^2)*(a^2 - 1)*arcsin(-(b^2*x + a
*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^3 + 3*(a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-
b^2*x^2 - 2*a*b*x - a^2 + 1)*a/b^3)*arcsin(b*x + a)
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.28

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)\,dx = \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}(bx+a)\arcsin(bx+a)}{4\,b} + \frac{3\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)}{8\,b} + \frac{(b^2x^2+2\,abx+a^2-1)^2}{16\,b} + \frac{3\arcsin(bx+a)^2}{16\,b} - \frac{3\,(b^2x^2+2\,abx+a^2-1)}{16\,b} - \frac{15}{128\,b}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="giac")
```

```
[Out] 1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)/b + 3/8*
sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b + 1/16*(b^2*
x^2 + 2*a*b*x + a^2 - 1)^2/b + 3/16*arcsin(b*x + a)^2/b - 3/16*(b^2*x^2 + 2
*a*b*x + a^2 - 1)/b - 15/128/b
```

Mupad [F(-1)]

Timed out.

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)\,dx = \int \mathrm{asin}(a+b\,x)\,\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}\,dx$$

```
[In] int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

```
[Out] int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.323 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 47

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b} + \frac{\text{CosIntegral}(4\arcsin(a+bx))}{8b} + \frac{3\log(\arcsin(a+bx))}{8b}$$

```
[Out] 1/2*Ci(2*arcsin(b*x+a))/b+1/8*Ci(4*arcsin(b*x+a))/b+3/8*ln(arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {4891, 4753, 3393, 3383}

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b} + \frac{\text{CosIntegral}(4\arcsin(a+bx))}{8b} + \frac{3\log(\arcsin(a+bx))}{8b}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x],x]
```

```
[Out] CosIntegral[2*ArcSin[a + b*x]]/(2*b) + CosIntegral[4*ArcSin[a + b*x]]/(8*b)
 + (3*Log[ArcSin[a + b*x]])/(8*b)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(1-x^2)^{3/2}}{\arcsin(x)}\,dx, x, a+bx\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{\cos^4(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos(2x)}{2x}+\frac{\cos(4x)}{8x}\right)\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{3\log(\arcsin(a+bx))}{8b}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \arcsin(a+bx)\right)}{8b}\\
&\quad+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{2b}\\
&= \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b}+\frac{\text{CosIntegral}(4\arcsin(a+bx))}{8b}+\frac{3\log(\arcsin(a+bx))}{8b}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{4\,\text{CosIntegral}(2\arcsin(a+bx)) + \text{CosIntegral}(4\arcsin(a+bx)) + 3\log(\text{ar}}{8b}$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x],x]
[Out] (4*CosIntegral[2*ArcSin[a + b*x]] + CosIntegral[4*ArcSin[a + b*x]] + 3*Log[
ArcSin[a + b*x]])/(8*b)
```

Maple [A] (verified)

Time = 1.79 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.77

method	result	size
default	$\frac{3\ln(\arcsin(bx+a))+4\ \text{Ci}(2\arcsin(bx+a))+\text{Ci}(4\arcsin(bx+a))}{8b}$	36

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x,method=_RETURNVERBOSE)
[Out] 1/8*(3*ln(arcsin(b*x+a))+4*Ci(2*arcsin(b*x+a))+Ci(4*arcsin(b*x+a)))/b
```

Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin(bx+a)}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="fricas
")
[Out] integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a), x)
```

Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}(a+bx)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a),x)
[Out] Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x), x)
```

Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="maxima
")
[Out] integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.87

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{\mathrm{Ci}\left(4\,\arcsin\left(bx+a\right)\right)}{8\,b} + \frac{\mathrm{Ci}\left(2\,\arcsin\left(bx+a\right)\right)}{2\,b} + \frac{3\,\log\left(\arcsin\left(bx+a\right)\right)}{8\,b}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="giac")
[Out] 1/8*cos_integral(4*arcsin(b*x + a))/b + 1/2*cos_integral(2*arcsin(b*x + a))
/b + 3/8*log(arcsin(b*x + a))/b
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x),x)
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x), x)
```

3.324 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2} dx$

Optimal result

Integrand size = 33, antiderivative size = 57

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2} dx = -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{\operatorname{Si}(2\arcsin(a+bx))}{b} - \frac{\operatorname{Si}(4\arcsin(a+bx))}{2b}$$

```
[Out] -(1-(b*x+a)^2)^2/b/arcsin(b*x+a)-Si(2*arcsin(b*x+a))/b-1/2*Si(4*arcsin(b*x+
a))/b
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {4891, 4751, 4809, 4491, 3380}

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2} dx = -\frac{\operatorname{Si}(2\arcsin(a+bx))}{b} - \frac{\operatorname{Si}(4\arcsin(a+bx))}{2b} - \frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^2,x]
```

```
[Out] -((1 - (a + b*x)^2)^2/(b*ArcSin[a + b*x])) - SinIntegral[2*ArcSin[a + b*x]]
/b - SinIntegral[4*ArcSin[a + b*x]]/(2*b)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{(1-x^2)^{3/2}}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{4\text{Subst}\left(\int \frac{x(1-x^2)}{\arcsin(x)}\,dx, x, a+bx\right)}{b}\\
&= -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{4\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}
\end{aligned}$$

$$= -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{4\text{Subst}\left(\int \left(\frac{\sin(2x)}{4x} + \frac{\sin(4x)}{8x}\right) dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\sin(4x)}{x} dx, x, \arcsin(a+bx)\right)}{2b} - \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x} dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{\text{Si}(2\arcsin(a+bx))}{b} - \frac{\text{Si}(4\arcsin(a+bx))}{2b}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2} dx = -\frac{2(-1+a^2+2abx+b^2x^2)^2 + 2\arcsin(a+bx)\text{Si}(2\arcsin(a+bx)) + \arcsin(a+bx)\text{Si}(4\arcsin(a+bx))}{2b\arcsin(a+bx)}$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^2,x]
[Out] -1/2*(2*(-1 + a^2 + 2*a*b*x + b^2*x^2)^2 + 2*ArcSin[a + b*x]*SinIntegral[2*
ArcSin[a + b*x]] + ArcSin[a + b*x]*SinIntegral[4*ArcSin[a + b*x]])/(b*ArcSi
n[a + b*x])
```

Maple [A] (verified)

Time = 1.78 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

method	result	size
default	$-\frac{8\ \text{Si}(2\arcsin(bx+a))\arcsin(bx+a)+4\ \text{Si}(4\arcsin(bx+a))\arcsin(bx+a)+4\cos(2\arcsin(bx+a))+\cos(4\arcsin(bx+a))+3}{8b\arcsin(bx+a)}$	70

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] -1/8/b*(8*Si(2*arcsin(b*x+a))*arcsin(b*x+a)+4*Si(4*arcsin(b*x+a))*arcsin(b*
x+a)+4*cos(2*arcsin(b*x+a))+cos(4*arcsin(b*x+a))+3)/arcsin(b*x+a)
```

Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx=\int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="fric
as")
[Out] integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^2, x)
```

Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx=\int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**2,x)
[Out] Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**2, x)
```

Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx=\int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="maxi
ma")
[Out] -(b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - b
*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate(4*(b^3*x^
3 + 3*a*b^2*x^2 + a^3 + (3*a^2 - 1)*b*x - a)/arctan2(b*x + a, sqrt(b*x + a
+ 1)*sqrt(-b*x - a + 1)), x) - 2*a^2 + 1)/(b*arctan2(b*x + a, sqrt(b*x + a
+ 1)*sqrt(-b*x - a + 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.07

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = -\frac{(b^2x^2+2\,abx+a^2-1)^2}{b\arcsin{(bx+a)}} - \frac{\mathrm{Si}\left(4\arcsin{(bx+a)}\right)}{2\,b} - \frac{\mathrm{Si}\left(2\arcsin{(bx+a)}\right)}{b}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] -(b^2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)) - 1/2*sin_integral(4*a
rcsin(b*x + a))/b - sin_integral(2*arcsin(b*x + a))/b
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = \int \frac{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}{\mathrm{asin}\left(a+b\,x\right)^2}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^2,x)
```

```
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^2, x)
```

3.325 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3} dx$

Optimal result

Integrand size = 33, antiderivative size = 90

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3} dx = -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2}+\frac{2(a+bx)(1-(a+bx)^2)^{3/2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b}-\frac{\text{CosIntegral}(4\arcsin(a+bx))}{b}$$

```
[Out] -1/2*(1-(b*x+a)^2)^2/b/arcsin(b*x+a)^2+2*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b/arcs
in(b*x+a)-Ci(2*arcsin(b*x+a))/b-Ci(4*arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {4891, 4751, 4799, 4753, 3393, 3383, 4809, 4491}

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3} dx = -\frac{\text{CosIntegral}(2\arcsin(a+bx))}{b} - \frac{\text{CosIntegral}(4\arcsin(a+bx))}{b}-\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2}+\frac{2(a+bx)(1-(a+bx)^2)^{3/2}}{b\arcsin(a+bx)}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^3,x]
```

```
[Out] -1/2*(1 - (a + b*x)^2)^2/(b*ArcSin[a + b*x]^2) + (2*(a + b*x)*(1 - (a + b*x
)^2)^(3/2))/(b*ArcSin[a + b*x]) - CosIntegral[2*ArcSin[a + b*x]]/b - CosInt
egral[4*ArcSin[a + b*x]]/b
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(1-x^2)^{3/2}}{\arcsin(x)^3}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} - \frac{2\text{Subst}\left(\int \frac{x(1-x^2)}{\arcsin(x)^2}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)}\,dx, x, a+bx\right)}{b} + \frac{8\text{Subst}\left(\int \frac{x^2\sqrt{1-x^2}}{\arcsin(x)}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b} + \frac{8\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{b\arcsin(a+bx)} - \frac{2\text{Subst}\left(\int \left(\frac{1}{2x}+\frac{\cos(2x)}{2x}\right)\,dx, x, \arcsin(a+bx)\right)}{b} + \frac{8\text{Subst}\left(\int \left(\frac{1}{8x}-\frac{\cos(4x)}{8x}\right)\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{b\arcsin(a+bx)} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b} - \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b} - \frac{\text{CosIntegral}(4\arcsin(a+bx))}{b}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.22

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = -\frac{\frac{(-1+a^2+2abx+b^2x^2)\left(-1+a^2+2abx+b^2x^2+4(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\right)}{\arcsin(a+bx)^2} + 2\,\text{CosIntegral}(2\arcsin(a+bx)) + 2\,\text{Co}}{2b}$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^3,x]
```

```
[Out] -1/2*(((-1 + a^2 + 2*a*b*x + b^2*x^2)*(-1 + a^2 + 2*a*b*x + b^2*x^2 + 4*(a
+ b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]))/ArcSin[a + b*x]^
2 + 2*CosIntegral[2*ArcSin[a + b*x]] + 2*CosIntegral[4*ArcSin[a + b*x]])/b
```

Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.20

method	result
default	$-\frac{16\ \text{Ci}(2\arcsin(bx+a))\arcsin(bx+a)^2+16\ \text{Ci}(4\arcsin(bx+a))\arcsin(bx+a)^2-8\sin(2\arcsin(bx+a))\arcsin(bx+a)-4\sin(4\arcsin(bx-}{16b\arcsin(bx+a)^2}$

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/b*(16*Ci(2*arcsin(b*x+a))*arcsin(b*x+a)^2+16*Ci(4*arcsin(b*x+a))*arcs
in(b*x+a)^2-8*sin(2*arcsin(b*x+a))*arcsin(b*x+a)-4*sin(4*arcsin(b*x+a))*arc
sin(b*x+a)+4*cos(2*arcsin(b*x+a))+cos(4*arcsin(b*x+a))+3)/arcsin(b*x+a)^2
```

Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="fric
as")
[Out] integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^3, x)
```

Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^3\left(a+bx\right)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**3,x)
[Out] Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**3, x)
```

Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^3}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="maxi
ma")
[Out] -1/2*(b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 - 2*b*arctan2(b*x
 + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate(2*(4*b^2*x^2 + 8*a*
b*x + 4*a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/arctan2(b*x + a, sqrt
(b*x + a + 1)*sqrt(-b*x - a + 1)), x) + 4*(a^3 - a)*b*x + 4*(b^3*x^3 + 3*a*
b^2*x^2 + a^3 + (3*a^2 - 1)*b*x - a)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*a
rctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) - 2*a^2 + 1)/(b*arcta
n2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

Giac [A] (verification not implemented)

none

Time = 0.37 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.12

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \frac{2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)}{b\arcsin\left(bx+a\right)} - \frac{\mathrm{Ci}\left(4\,\arcsin\left(bx+a\right)\right)}{b} - \frac{\mathrm{Ci}\left(2\,\arcsin\left(bx+a\right)\right)}{b} - \frac{\left(b^2x^2+2\,abx+a^2-1\right)^2}{2\,b\arcsin\left(bx+a\right)^2}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] 2*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/(b*arcsin(b*x + a)) - cos_
integral(4*arcsin(b*x + a))/b - cos_integral(2*arcsin(b*x + a))/b - 1/2*(b^
2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^3,x)
```

```
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^3, x)
```

3.326 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 155

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)(1-(a+bx)^2)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} - \frac{8(a+bx)^2(1-(a+bx)^2)}{3b\arcsin(a+bx)} + \frac{2\operatorname{Si}(2\arcsin(a+bx))}{3b} + \frac{4\operatorname{Si}(4\arcsin(a+bx))}{3b}$$

```
[Out] -1/3*(1-(b*x+a)^2)^2/b/arcsin(b*x+a)^3+2/3*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b/ar
csin(b*x+a)^2+2/3*(1-(b*x+a)^2)/b/arcsin(b*x+a)-8/3*(b*x+a)^2*(1-(b*x+a)^2)
/b/arcsin(b*x+a)+2/3*Si(2*arcsin(b*x+a))/b+4/3*Si(4*arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {4891, 4751, 4799, 4731, 4491, 12, 3380}

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \frac{2\operatorname{Si}(2\arcsin(a+bx))}{3b} + \frac{4\operatorname{Si}(4\arcsin(a+bx))}{3b} - \frac{8(1-(a+bx)^2)(a+bx)^2}{3b\arcsin(a+bx)} + \frac{2(1-(a+bx)^2)^{3/2}(a+bx)}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} - \frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3}$$

```
[In] Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^4,x]
```

```
[Out] -1/3*(1 - (a + b*x)^2)^2/(b*ArcSin[a + b*x]^3) + (2*(a + b*x)*(1 - (a + b*x
)^2)^(3/2))/(3*b*ArcSin[a + b*x]^2) + (2*(1 - (a + b*x)^2))/(3*b*ArcSin[a +
 b*x]) - (8*(a + b*x)^2*(1 - (a + b*x)^2))/(3*b*ArcSin[a + b*x]) + (2*SinIn
tegral[2*ArcSin[a + b*x]])/(3*b) + (4*SinIntegral[4*ArcSin[a + b*x]])/(3*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{(1-x^2)^{3/2}}{\arcsin(x)^4}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} - \frac{4\text{Subst}\left(\int \frac{x(1-x^2)}{\arcsin(x)^3}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{3b\arcsin(a+bx)^2} - \frac{2\text{Subst}\left(\int \frac{\sqrt{1-x^2}}{\arcsin(x)^2}\,dx, x, a+bx\right)}{3b} + \frac{8\text{Subst}\left(\int \frac{x^2\sqrt{1-x^2}}{\arcsin(x)^2}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} - \frac{8(a+bx)^2(1-(a+bx)^2)}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{x}{\arcsin(x)}\,dx, x, a+bx\right)}{3b} + \frac{16\text{Subst}\left(\int \frac{x}{\arcsin(x)}\,dx, x, a+bx\right)}{3b} - \frac{32\text{Subst}\left(\int \frac{x^3}{\arcsin(x)}\,dx, x, a+bx\right)}{3b}$$

$$= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} - \frac{8(a+bx)^2(1-(a+bx)^2)}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b} + \frac{16\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b} - \frac{32\text{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b}$$

$$
\begin{aligned}
&= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\,(1-(a+bx)^2)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} \\
&\quad - \frac{8(a+bx)^2\,(1-(a+bx)^2)}{3b\arcsin(a+bx)} + \frac{4\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{3b} \\
&\quad + \frac{16\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \arcsin(a+bx)\right)}{3b} \\
&\quad - \frac{32\text{Subst}\left(\int \left(\frac{\sin(2x)}{4x} - \frac{\sin(4x)}{8x}\right)\,dx, x, \arcsin(a+bx)\right)}{3b}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\,(1-(a+bx)^2)^{3/2}}{3b\arcsin(a+bx)^2} \\
&\quad + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} - \frac{8(a+bx)^2\,(1-(a+bx)^2)}{3b\arcsin(a+bx)} \\
&\quad + \frac{2\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b} + \frac{4\text{Subst}\left(\int \frac{\sin(4x)}{x}\,dx, x, \arcsin(a+bx)\right)}{3b}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} + \frac{2(a+bx)\,(1-(a+bx)^2)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} \\
&\quad - \frac{8(a+bx)^2\,(1-(a+bx)^2)}{3b\arcsin(a+bx)} + \frac{2\text{Si}(2\arcsin(a+bx))}{3b} + \frac{4\text{Si}(4\arcsin(a+bx))}{3b}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.92

$$
\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \frac{\frac{(-1+a^2+2abx+b^2x^2)\left(1-a^2-2abx-b^2x^2-2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)+2(-1+4a^2+8\right.}{\arcsin(a+bx)^3}}{3b}
$$

```
[In] Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^4,x]
```

```
[Out] (((-1 + a^2 + 2*a*b*x + b^2*x^2)*(1 - a^2 - 2*a*b*x - b^2*x^2 - 2*(a + b*x)
*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x] + 2*(-1 + 4*a^2 + 8*a*b*
x + 4*b^2*x^2)*ArcSin[a + b*x]^2))/ArcSin[a + b*x]^3 + 2*SinIntegral[2*ArcS
in[a + b*x]] + 4*SinIntegral[4*ArcSin[a + b*x]])/(3*b)
```

Maple [A] (verified)

Time = 1.84 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.95

method	result
default	$\frac{16\ \mathrm{Si}(2\arcsin(bx+a))\arcsin(bx+a)^3+32\ \mathrm{Si}(4\arcsin(bx+a))\arcsin(bx+a)^3+8\cos(2\arcsin(bx+a))\arcsin(bx+a)^2+8\cos(4\arcsin(bx-}{24b\,\mathrm{a}}$

```
[In] int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/24/b*(16*Si(2*arcsin(b*x+a))*arcsin(b*x+a)^3+32*Si(4*arcsin(b*x+a))*arcsi
n(b*x+a)^3+8*cos(2*arcsin(b*x+a))*arcsin(b*x+a)^2+8*cos(4*arcsin(b*x+a))*ar
csin(b*x+a)^2+4*sin(2*arcsin(b*x+a))*arcsin(b*x+a)+2*sin(4*arcsin(b*x+a))*a
rcsin(b*x+a)-4*cos(2*arcsin(b*x+a))-cos(4*arcsin(b*x+a))-3)/arcsin(b*x+a)^3
```

Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx=\int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^4}\,dx$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="fric
as")
```

```
[Out] integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^4, x)
```

Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx=\int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^4\left(a+bx\right)}\,dx$$

```
[In] integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**4,x)
```

```
[Out] Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**4, x)
```

Maxima [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \text{Timed out}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="maxi
ma")
```

```
[Out] Timed out
```

Giac [A] (verification not implemented)

none

Time = 0.40 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.05

$$\begin{aligned}\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx &= \frac{8\,(b^2x^2+2\,abx+a^2-1)^2}{3\,b\arcsin{(bx+a)}} \\ &+ \frac{4\,\mathrm{Si}\,(4\,\arcsin{(bx+a)})}{3\,b} + \frac{2\,\mathrm{Si}\,(2\,\arcsin{(bx+a)})}{3\,b} \\ &+ \frac{2\,(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}(bx+a)}{3\,b\arcsin{(bx+a)}^2} \\ &+ \frac{2\,(b^2x^2+2\,abx+a^2-1)}{b\arcsin{(bx+a)}} - \frac{(b^2x^2+2\,abx+a^2-1)^2}{3\,b\arcsin{(bx+a)}^3}\end{aligned}$$

```
[In] integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] 8/3*(b^2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)) + 4/3*sin_integral(
4*arcsin(b*x + a))/b + 2/3*sin_integral(2*arcsin(b*x + a))/b + 2/3*(-b^2*x^
2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/(b*arcsin(b*x + a)^2) + 2*(b^2*x^2 +
 2*a*b*x + a^2 - 1)/(b*arcsin(b*x + a)) - 1/3*(b^2*x^2 + 2*a*b*x + a^2 - 1)
^2/(b*arcsin(b*x + a)^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \int \frac{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}{{\mathrm{asin}\left(a+b\,x\right)}^4}\,dx$$

```
[In] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^4,x)
```

```
[Out] int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^4, x)
```

3.327 $\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 19

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^{1+n}}{b(1+n)}$$

```
[Out] arcsin(b*x+a)^(1+n)/b/(1+n)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {4891, 4737}

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^{n+1}}{b(n+1)}$$

```
[In] Int[ArcSin[a + b*x]^n/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

```
[Out] ArcSin[a + b*x]^(1 + n)/(b*(1 + n))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)^n}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\ &= \frac{\arcsin(a+bx)^{1+n}}{b(1+n)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^{1+n}}{b(1+n)}$$

```
[In] Integrate[ArcSin[a + b*x]^n/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
[Out] ArcSin[a + b*x]^(1 + n)/(b*(1 + n))
```

Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.05

method	result	size
default	$\frac{\arcsin(bx+a)^{1+n}}{b(1+n)}$	20

```
[In] int(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] arcsin(b*x+a)^(1+n)/b/(1+n)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.16

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^n \arcsin\left(bx+a\right)}{bn+b}$$

```
[In] integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fric
as")
[Out] arcsin(b*x + a)^n*arcsin(b*x + a)/(b*n + b)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. $2(14) = 28$.

Time = 0.45 (sec) , antiderivative size = 60, normalized size of antiderivative = 3.16

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{x}{\sqrt{1-a^2}\operatorname{asin}(a)} & \text{for } b=0 \wedge n=-1 \\ \frac{x\operatorname{asin}^n(a)}{\sqrt{1-a^2}} & \text{for } b=0 \\ \frac{\log(\operatorname{asin}(a+bx))}{b} & \text{for } n=-1 \\ \frac{\operatorname{asin}(a+bx)\operatorname{asin}^n(a+bx)}{bn+b} & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(b*x+a)**n/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/(sqrt(1 - a**2)*asin(a)), Eq(b, 0) & Eq(n, -1)), (x*asin(a)**n
/sqrt(1 - a**2), Eq(b, 0)), (log(asin(a + b*x))/b, Eq(n, -1)), (asin(a + b*
x)*asin(a + b*x)**n/(b*n + b), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(bx+a)^{n+1}}{b(n+1)}$$

```
[In] integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac
")
```

```
[Out] arcsin(b*x + a)^(n + 1)/(b*(n + 1))
```

Mupad [B] (verification not implemented)

Time = 0.53 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.95

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\ln(\mathrm{asin}(a+b\,x))}{b} & \text{if } n=-1 \\ \frac{\mathrm{asin}(a+b\,x)^{n+1}}{b\,(n+1)} & \text{if } n\neq -1 \end{cases}$$

```
[In] int(asin(a + b*x)^n/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
[Out] piecewise(n == -1, log(asin(a + b*x))/b, n ~= -1, asin(a + b*x)^(n + 1)/(b*
(n + 1)))
```

3.328 $\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 15

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^3}{3b}$$

```
[Out] 1/3*arcsin(b*x+a)^3/b
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {4891, 4737}

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^3}{3b}$$

```
[In] Int[ArcSin[a + b*x]^2/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

```
[Out] ArcSin[a + b*x]^3/(3*b)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}\\ &= \frac{\arcsin(a+bx)^3}{3b}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^3}{3b}$$

```
[In] Integrate[ArcSin[a + b*x]^2/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
[Out] ArcSin[a + b*x]^3/(3*b)
```

Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

method	result	size
default	$\frac{\arcsin(bx+a)^3}{3b}$	14

```
[In] int(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/3*arcsin(b*x+a)^3/b
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^3}{3\,b}$$

```
[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fric
as")
[Out] 1/3*arcsin(b*x + a)^3/b
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 26 vs. $2(10) = 20$.

Time = 0.30 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.73

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^3(a+bx)}{3b} & \text{for } b \neq 0 \\ \frac{x\operatorname{asin}^2(a)}{\sqrt{1-a^2}} & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
[Out] Piecewise((asin(a + b*x)**3/(3*b), Ne(b, 0)), (x*asin(a)**2/sqrt(1 - a**2),
 True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 130 vs. $2(13) = 26$.

Time = 0.29 (sec) , antiderivative size = 130, normalized size of antiderivative = 8.67

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = -\frac{\arcsin(bx+a)^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b} - \frac{\arcsin(bx+a)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{b} - \frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^3}{3\,b}$$

```
[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxi
ma")
[Out] -arcsin(b*x + a)^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b -
 arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b -
 1/3*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^3/b
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(bx+a)^3}{3\,b}$$

```
[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac
")
[Out] 1/3*arcsin(b*x + a)^3/b
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\operatorname{asin}(a+b\,x)^3}{3\,b}$$

```
[In] int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
[Out] asin(a + b*x)^3/(3*b)
```

3.329 $\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 15

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^2}{2b}$$

```
[Out] 1/2*arcsin(b*x+a)^2/b
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065, Rules used = {4891, 4737}

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^2}{2b}$$

```
[In] Int[ArcSin[a + b*x]/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

```
[Out] ArcSin[a + b*x]^2/(2*b)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx, x, a+bx\right)}{b}$$
$$= \frac{\arcsin(a+bx)^2}{2b}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^2}{2b}$$

```
[In] Integrate[ArcSin[a + b*x]/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
[Out] ArcSin[a + b*x]^2/(2*b)
```

Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

method	result	size
default	$\frac{\arcsin(bx+a)^2}{2b}$	14

```
[In] int(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arcsin(b*x+a)^2/b
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^2}{2\,b}$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fricas
")
[Out] 1/2*arcsin(b*x + a)^2/b
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 24 vs. $2(10) = 20$.

Time = 0.25 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.60

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^2(a+bx)}{2b} & \text{for } b \neq 0 \\ \frac{x\operatorname{asin}(a)}{\sqrt{1-a^2}} & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

```
[Out] Piecewise((asin(a + b*x)**2/(2*b), Ne(b, 0)), (x*asin(a)/sqrt(1 - a**2), Tr
ue))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 83 vs. $2(13) = 26$.

Time = 0.28 (sec) , antiderivative size = 83, normalized size of antiderivative = 5.53

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = -\frac{\arcsin(bx+a)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b} - \frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\,b}$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxima
")
```

```
[Out] -arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b - 1
/2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(bx+a)^2}{2\,b}$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*arcsin(b*x + a)^2/b
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\operatorname{asin}(a+b\,x)^2}{2\,b}$$

```
[In] int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
[Out] asin(a + b*x)^2/(2*b)
```

3.330 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 11

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(\arcsin(a+bx))}{b}$$

```
[Out] ln(arcsin(b*x+a))/b
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {4891, 4735}

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(\arcsin(a+bx))}{b}$$

```
[In] Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]),x]
```

```
[Out] Log[ArcSin[a + b*x]]/b
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
```

```
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)}\,dx, x, a+bx\right)}{b}$$
$$= \frac{\log(\arcsin(a+bx))}{b}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(\arcsin(a+bx))}{b}$$

```
[In] Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]),x]
[Out] Log[ArcSin[a + b*x]]/b
```

Maple [A] (verified)

Time = 1.69 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

method	result	size
default	$\frac{\ln(\arcsin(bx+a))}{b}$	12

```
[In] int(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] ln(arcsin(b*x+a))/b
```

Fricas [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.18

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(-\arcsin(bx+a))}{b}$$

```
[In] integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fric
as")
[Out] log(-arcsin(b*x + a))/b
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 22 vs. $2(8) = 16$.

Time = 0.28 (sec) , antiderivative size = 22, normalized size of antiderivative = 2.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \begin{cases} \frac{\log(\operatorname{asin}(a+bx))}{b} & \text{for } b \neq 0 \\ \frac{x}{\sqrt{1-a^2}\operatorname{asin}(a)} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
[Out] Piecewise((log(asin(a + b*x))/b, Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a)), Tr
ue))
```

Maxima [F]

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \int \frac{1}{\sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxi
ma")
[Out] integrate(1/(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(|\arcsin(bx+a)|)}{b}$$

```
[In] integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac
")
[Out] log(abs(arcsin(b*x + a)))/b
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx=\frac{\ln\left(\text{asin}(a+b\,x)\right)}{b}$$

```
[In] int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
[Out] log(asin(a + b*x))/b
```

3.331 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 13

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx=-\frac{1}{b\arcsin(a+bx)}$$

```
[Out] -1/b/arcsin(b*x+a)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {4891, 4737}

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx=-\frac{1}{b\arcsin(a+bx)}$$

```
[In] Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2),x]
```

```
[Out] -(1/(b*ArcSin[a + b*x]))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)^2}\,dx, x, a+bx\right)}{b}\\ &= -\frac{1}{b\arcsin(a+bx)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(a+bx)}$$

```
[In] Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2),x]
[Out] -(1/(b*ArcSin[a + b*x]))
```

Maple [A] (verified)

Time = 1.82 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.08

method	result	size
default	$-\frac{1}{b\arcsin(bx+a)}$	14

```
[In] int(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOS
E)
[Out] -1/b/arcsin(b*x+a)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(bx+a)}$$

```
[In] integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fr
icas")
[Out] -1/(b*arcsin(b*x + a))
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 26 vs. 2(10) = 20.

Time = 0.46 (sec) , antiderivative size = 26, normalized size of antiderivative = 2.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = \begin{cases} -\frac{1}{b\,\mathrm{asin}\,(a+bx)} & \text{for } b\neq 0 \\ \frac{x}{\sqrt{1-a^2}\,\mathrm{asin}^2\,(a)} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
[Out] Piecewise((-1/(b*asin(a + b*x)), Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a)**2),
 True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 33 vs. 2(13) = 26.

Time = 0.61 (sec) , antiderivative size = 33, normalized size of antiderivative = 2.54

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arctan\left(bx+a,\sqrt{bx+a+1}\sqrt{-bx-a+1}\right)}$$

```
[In] integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="ma
xima")
[Out] -1/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin{(bx+a)}}$$

```
[In] integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gi
ac")
```

```
[Out] -1/(b*arcsin(b*x + a))
```

Mupad [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\,\mathrm{asin}\left(a+b\,x\right)}$$

```
[In] int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
```

```
[Out] -1/(b*asin(a + b*x))
```

3.332 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 15

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2b\arcsin(a+bx)^2}$$

```
[Out] -1/2/b/arcsin(b*x+a)^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {4891, 4737}

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2b\arcsin(a+bx)^2}$$

```
[In] Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3),x]
```

```
[Out] -1/2*1/(b*ArcSin[a + b*x]^2)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
```

```
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)^3}\,dx, x, a+bx\right)}{b}$$
$$= -\frac{1}{2b\arcsin(a+bx)^2}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2b\arcsin(a+bx)^2}$$

```
[In] Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3),x]
[Out] -1/2*1/(b*ArcSin[a + b*x]^2)
```

Maple [A] (verified)

Time = 1.82 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

method	result	size
default	$-\frac{1}{2b\arcsin(bx+a)^2}$	14

```
[In] int(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOS
E)
[Out] -1/2/b/arcsin(b*x+a)^2
```

Fricas [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arcsin\left(bx+a\right)^2}$$

```
[In] integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fr
icas")
```

```
[Out] -1/2/(b*arcsin(b*x + a)^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 29 vs. 2(14) = 28.

Time = 0.65 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.93

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = \begin{cases} -\frac{1}{2b\,\mathrm{asin}^2\,(a+bx)} & \text{for } b \neq 0 \\ \frac{x}{\sqrt{1-a^2}\,\mathrm{asin}^3\,(a)} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/asin(b*x+a)**3/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

```
[Out] Piecewise((-1/(2*b*asin(a + b*x)**2), Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a)
**3), True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 33 vs. 2(13) = 26.

Time = 17.15 (sec) , antiderivative size = 33, normalized size of antiderivative = 2.20

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arctan\left(bx+a,\sqrt{bx+a+1}\sqrt{-bx-a+1}\right)^2}$$

```
[In] integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="ma
xima")
```

```
[Out] -1/2/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

Giac [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arcsin\left(bx+a\right)^2}$$

```
[In] integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gi
ac")
```

```
[Out] -1/2/(b*arcsin(b*x + a)^2)
```

Mupad [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\,\mathrm{asin}\left(a+b\,x\right)^2}$$

```
[In] int(1/(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
```

```
[Out] -1/(2*b*asin(a + b*x)^2)
```

3.333 $\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 128

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{3i\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{3\,\mathrm{PolyLog}\left(3,-e^{2i\arcsin(a+bx)}\right)}{2b}$$

```
[Out] -I*arcsin(b*x+a)^3/b+3*arcsin(b*x+a)^2*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
^2)/b-3*I*arcsin(b*x+a)*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+3/2
*polylog(3,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+(b*x+a)*arcsin(b*x+a)^3/b/
(1-(b*x+a)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {4891, 4745, 4765, 3800, 2221, 2611, 2320, 6724}

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{3i\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{3\,\mathrm{PolyLog}\left(3,-e^{2i\arcsin(a+bx)}\right)}{2b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} - \frac{i\arcsin(a+bx)^3}{b} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b}$$

```
[In] Int[ArcSin[a + b*x]^3/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

```
[Out] ((-I)*ArcSin[a + b*x]^3)/b + ((a + b*x)*ArcSin[a + b*x]^3)/(b*Sqrt[1 - (a +
 b*x)^2]) + (3*ArcSin[a + b*x]^2*Log[1 + E^((2*I)*ArcSin[a + b*x])])/b - ((
3*I)*ArcSin[a + b*x]*PolyLog[2, -E^((2*I)*ArcSin[a + b*x])])/b + (3*PolyLog
[3, -E^((2*I)*ArcSin[a + b*x])])/(2*b)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)^3}{(1-x^2)^{3/2}}\,dx, x, a+bx\right)}{b} \\
&= \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} - \frac{3\text{Subst}\left(\int \frac{x\arcsin(x)^2}{1-x^2}\,dx, x, a+bx\right)}{b} \\
&= \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} - \frac{3\text{Subst}\left(\int x^2\tan(x)\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{(6i)\text{Subst}\left(\int \frac{e^{2ix}x^2}{1+e^{2ix}}\,dx, x, \arcsin(a+bx)\right)}{b} \\
&= -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} \\
&\quad + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} \\
&\quad - \frac{6\text{Subst}\left(\int x\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(a+bx)\right)}{b}
\end{aligned}
$$

$$= -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{3i\arcsin(a+bx)\,\text{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{(3i)\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{3i\arcsin(a+bx)\,\text{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{3\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(a+bx)}\right)}{2b}$$

$$= -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{3i\arcsin(a+bx)\,\text{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{3\,\text{PolyLog}\left(3,-e^{2i\arcsin(a+bx)}\right)}{2b}$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.12

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{2\arcsin(a+bx)^2\left(\frac{\left(a+bx-i\sqrt{1-a^2-2abx-b^2x^2}\right)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}} + 3\log\left(1+e^{2i\arcsin(a\right.\right.}}{}$$

```
[In] Integrate[ArcSin[a + b*x]^3/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

```
[Out] (2*ArcSin[a + b*x]^2*(((a + b*x - I*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])*ArcS
in[a + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 3*Log[1 + E^((2*I)*ArcSin[
a + b*x])]) - (6*I)*ArcSin[a + b*x]*PolyLog[2, -E^((2*I)*ArcSin[a + b*x])]
+ 3*PolyLog[3, -E^((2*I)*ArcSin[a + b*x])])/(2*b)
```

Maple [A] (verified)

Time = 3.27 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.79

method	result
default	$\frac{\left(-xb\sqrt{-b^2x^2-2abx-a^2+1}+ib^2x^2-a\sqrt{-b^2x^2-2abx-a^2+1}+2iabx+ia^2-i\right)\arcsin(bx+a)^3}{b(b^2x^2+2abx+a^2-1)}+\frac{-4i\arcsin(bx+a)^3+6\arcsin(bx+a)}{}$

```
[In] int(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE)
[Out] (-x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+I*b^2*x^2-a*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2)+2*I*a*b*x+I*a^2-I)/b/(b^2*x^2+2*a*b*x+a^2-1)*arcsin(b*x+a)^3+1/2*(-4*I
*arcsin(b*x+a)^3+6*arcsin(b*x+a)^2*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)-
6*I*arcsin(b*x+a)*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)+3*polylog(3
,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2))/b
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx=\int \frac{\arcsin\left(bx+a\right)^3}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="fric
as")
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^3/(b^4*x^4 + 4*
a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1), x)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx=\int \frac{\operatorname{asin}^3\left(a+bx\right)}{\left(-\left(a+bx-1\right)\left(a+bx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(b*x+a)**3/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)
[Out] Integral(asin(a + b*x)**3/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.48 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.07

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{3}{2}b\left(\frac{\log(bx+a+1)}{b^2}+\frac{\log(bx+a-1)}{b^2}\right)\arcsin(bx+a)^2 + \left(\frac{b^2x}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}+\frac{ab}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}\right)\arcsin(bx+a)^3$$

```
[In] integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] 3/2*b*(log(b*x + a + 1)/b^2 + log(b*x + a - 1)/b^2)*arcsin(b*x + a)^2 + (b^
2*x/((a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)) + a*b/((
a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)))*arcsin(b*x +
a)^3
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin(bx+a)^3}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="giac
")
```

```
[Out] integrate(arcsin(b*x + a)^3/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^3}{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}\,dx$$

```
[In] int(asin(a + b*x)^3/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

```
[Out] int(asin(a + b*x)^3/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.334 $\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 97

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{i\arcsin(a+bx)^2}{b}+\frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b}-\frac{i\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b}$$

```
[Out] -I*arcsin(b*x+a)^2/b+2*arcsin(b*x+a)*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2
)/b-I*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+(b*x+a)*arcsin(b*x+a)
^2/b/(1-(b*x+a)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {4891, 4745, 4765, 3800, 2221, 2317, 2438}

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{i\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}}-\frac{i\arcsin(a+bx)^2}{b}+\frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b}$$

```
[In] Int[ArcSin[a + b*x]^2/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

```
[Out] ((-I)*ArcSin[a + b*x]^2)/b + ((a + b*x)*ArcSin[a + b*x]^2)/(b*Sqrt[1 - (a +
 b*x)^2]) + (2*ArcSin[a + b*x]*Log[1 + E^((2*I)*ArcSin[a + b*x])])/b - (I*P
olyLog[2, -E^((2*I)*ArcSin[a + b*x])])/b
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(x)^2}{(1-x^2)^{3/2}}\,dx, x, a+bx\right)}{b}$$

$$= \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} - \frac{2\text{Subst}\left(\int \frac{x\arcsin(x)}{1-x^2}\,dx, x, a+bx\right)}{b}$$

$$= \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} - \frac{2\text{Subst}(\int x\tan(x)\,dx, x, \arcsin(a+bx))}{b}$$

$$= -\frac{i\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{(4i)\text{Subst}\left(\int \frac{e^{2ix}x}{1+e^{2ix}}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{i\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{2\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= -\frac{i\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} + \frac{i\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(a+bx)}\right)}{b}$$

$$= -\frac{i\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{i\,\text{PolyLog}\left(2, -e^{2i\arcsin(a+bx)}\right)}{b}$$

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.18

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{\arcsin(a+bx)\left(\frac{\left(a+bx-i\sqrt{1-a^2-2abx-b^2x^2}\right)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}} + 2\log\left(1+e^{2i\arcsin(a+}\right.\right.}{b}$$

```
[In] Integrate[ArcSin[a + b*x]^2/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

```
[Out] (ArcSin[a + b*x]*(((a + b*x - I*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])*ArcSin[a
 + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 2*Log[1 + E^((2*I)*ArcSin[a +
b*x])]) - I*PolyLog[2, -E^((2*I)*ArcSin[a + b*x])])/b
```

Maple [A] (verified)

Time = 2.88 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.95

method	result
default	$\frac{\left(-xb\sqrt{-b^2x^2-2abx-a^2+1}+ib^2x^2-a\sqrt{-b^2x^2-2abx-a^2+1}+2iabx+ia^2-i\right)\arcsin(bx+a)^2}{(b^2x^2+2abx+a^2-1)b}-\frac{i\left(2i\arcsin(bx+a)\ln\left(1+\left(i(bx+a)+\right.\right.\right.}{}$

[In] int(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE)

[Out] (-x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+I*b^2*x^2-a*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+2*I*a*b*x+I*a^2-I)/(b^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2-I*(2*I*arcsin(b*x+a)*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)+2*arcsin(b*x+a)^2+polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2))/b

Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx=\int \frac{\arcsin\left(bx+a\right)^2}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}}\,dx$$

[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^2/(b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1), x)

Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx=\int \frac{\operatorname{asin}^2\left(a+bx\right)}{\left(-\left(a+bx-1\right)\left(a+bx+1\right)\right)^{\frac{3}{2}}}\,dx$$

[In] integrate(asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)

[Out] Integral(asin(a + b*x)**2/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="maxi
ma")
[Out] integrate(arcsin(b*x + a)^2/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="giac
")
[Out] integrate(arcsin(b*x + a)^2/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

```
[In] int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
[Out] int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.335 $\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 50

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{(a+bx)\arcsin(a+bx)}{b\sqrt{1-(a+bx)^2}} + \frac{\log\left(1-(a+bx)^2\right)}{2b}$$

```
[Out] 1/2*ln(1-(b*x+a)^2)/b+(b*x+a)*arcsin(b*x+a)/b/(1-(b*x+a)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {4891, 4745, 266}

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{(a+bx)\arcsin(a+bx)}{b\sqrt{1-(a+bx)^2}} + \frac{\log\left(1-(a+bx)^2\right)}{2b}$$

```
[In] Int[ArcSin[a + b*x]/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

```
[Out] ((a + b*x)*ArcSin[a + b*x])/(b*Sqrt[1 - (a + b*x)^2]) + Log[1 - (a + b*x)^2
]/(2*b)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
```

```
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{(1-x^2)^{3/2}}\,dx, x, a+bx\right)}{b}\\ &= \frac{(a+bx)\arcsin(a+bx)}{b\sqrt{1-(a+bx)^2}} - \frac{\text{Subst}\left(\int \frac{x}{1-x^2}\,dx, x, a+bx\right)}{b}\\ &= \frac{(a+bx)\arcsin(a+bx)}{b\sqrt{1-(a+bx)^2}} + \frac{\log\left(1-(a+bx)^2\right)}{2b}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.32

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{\frac{2(a+bx)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}} + \log\left(1-a^2-2abx-b^2x^2\right)}{2b}$$

```
[In] Integrate[ArcSin[a + b*x]/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
[Out] ((2*(a + b*x)*ArcSin[a + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + Log[1 -
a^2 - 2*a*b*x - b^2*x^2])/(2*b)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 154 vs. $2(46) = 92$.

Time = 2.00 (sec) , antiderivative size = 155, normalized size of antiderivative = 3.10

method	result
default	$-\frac{-\ln\left(1-(bx+a)^2\right)b^2x^2+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,bx-2\ln\left(1-(bx+a)^2\right)abx+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a-}{2b(b^2x^2+2abx+a^2-1)}$

```
[In] int(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE)
[Out] -1/2/b*(-ln(1-(b*x+a)^2)*b^2*x^2+2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2)*b*x-2*ln(1-(b*x+a)^2)*a*b*x+2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2)*a-ln(1-(b*x+a)^2)*a^2+ln(1-(b*x+a)^2))/(b^2*x^2+2*a*b*x+a^2-1)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 99 vs. 2(46) = 92.

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.98

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{2\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)-(b^2x^2+2\,abx+a^2-1)\log(b^2x^2+2\,abx+a^2-1)}{2\,(b^3x^2+2\,ab^2x+(a^2-1)b)}$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="fricas
")
[Out] -1/2*(2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a) - (b^2
*x^2 + 2*a*b*x + a^2 - 1)*log(b^2*x^2 + 2*a*b*x + a^2 - 1))/(b^3*x^2 + 2*a*
b^2*x + (a^2 - 1)*b)
```

Sympy [F]

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}(a+bx)}{(-(a+bx-1)(a+bx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)
[Out] Integral(asin(a + b*x)/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 160 vs. 2(46) = 92.

Time = 0.33 (sec) , antiderivative size = 160, normalized size of antiderivative = 3.20

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{1}{2}\left(a\left(\frac{\log(bx+a+1)}{b^2}-\frac{\log(bx+a-1)}{b^2}\right)-\frac{(a+1)\log(bx+a+1)}{b^2}+\frac{(a-1)\log(bx+a-1)}{b^2}\right)b + \left(\frac{b^2x}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}+\frac{ab}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}\right)\arcsin(bx+a)$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/2*(a*(log(b*x + a + 1)/b^2 - log(b*x + a - 1)/b^2) - (a + 1)*log(b*x + a
 + 1)/b^2 + (a - 1)*log(b*x + a - 1)/b^2)*b + (b^2*x/((a^2*b^2 - (a^2 - 1)*
b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)) + a*b/((a^2*b^2 - (a^2 - 1)*b^2)*s
qrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)))*arcsin(b*x + a)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.66

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}\left(x+\frac{a}{b}\right)\arcsin\left(bx+a\right)}{b^2x^2+2\,abx+a^2-1} + \frac{\log\left(|bx+a+1|\right)}{2\,b} + \frac{\log\left(|bx+a-1|\right)}{2\,b}$$

```
[In] integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="giac")
```

```
[Out] -sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(x + a/b)*arcsin(b*x + a)/(b^2*x^2 + 2*
a*b*x + a^2 - 1) + 1/2*log(abs(b*x + a + 1))/b + 1/2*log(abs(b*x + a - 1))/
b
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

```
[In] int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

```
[Out] int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

3.336 $\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 33

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\mathrm{Int}\left(\frac{1}{(1-(a+bx)^2)^{3/2}\arcsin(a+bx)},x\right)$$

```
[Out] Unintegrable(1/(1-(b*x+a)^2)^(3/2)/arcsin(b*x+a),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx$$

```
[In] Int[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]),x]
[Out] Defer[Subst][Defer[Int][1/((1 - x^2)^(3/2)*ArcSin[x]), x], x, a + b*x]/b
```

Rubi steps

$$\text{integral}=\frac{\text{Subst}\left(\int \frac{1}{(1-x^2)^{3/2}\arcsin(x)}\,dx,x,a+bx\right)}{b}$$

Mathematica [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.06

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx$$

```
[In] Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]),x]
[Out] Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.74 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.94

$$\int \frac{1}{(-b^2x^2-2abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)}dx$$

```
[In] int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x)
[Out] int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 87, normalized size of antiderivative = 2.64

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="fric
as")
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3*
a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arcsin(b*x + a)), x)
```

Sympy [N/A]

Not integrable

Time = 3.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.82

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(-(a+bx-1)(a+bx+1))^{\frac{3}{2}}\operatorname{asin}(a+bx)}\,dx$$

```
[In] integrate(1/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a),x)
[Out] Integral(1/((-(a + b*x - 1)*(a + b*x + 1))**(3/2)*asin(a + b*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="maxi
ma")
[Out] integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="giac
")
[Out] integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{\mathrm{asin}\left(a+b\,x\right)\,{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

```
[In] int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)),x)
[Out] int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)), x)
```

3.337 $\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 33

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\,(1-(a+bx)^2)\arcsin(a+bx)}+2\mathrm{Int}\left(\frac{a+bx}{(1-(a+bx)^2)^2\arcsin(a+bx)},x\right)$$

```
[Out] -1/b/(1-(b*x+a)^2)/arcsin(b*x+a)+2*Unintegrable((b*x+a)/(1-(b*x+a)^2)^2/arc
sin(b*x+a),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx=\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx$$

```
[In] Int[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2),x]
```

```
[Out] -(1/(b*(1 - (a + b*x)^2)*ArcSin[a + b*x])) + (2*Defer[Subst][Defer[Int][x/(
(1 - x^2)^2*ArcSin[x]), x], x, a + b*x])/b
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{1}{(1-x^2)^{3/2}\arcsin(x)^2}\,dx,x,a+bx\right)}{b}\\ &= -\frac{1}{b\,(1-(a+bx)^2)\arcsin(a+bx)}+\frac{2\text{Subst}\left(\int \frac{x}{(1-x^2)^2\arcsin(x)}\,dx,x,a+bx\right)}{b}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 8.40 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.06

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx$$

```
[In] Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2),x]
[Out] Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.75 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.94

$$\int \frac{1}{(-b^2x^2-2abx-a^2+1)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2}dx$$

```
[In] int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x)
[Out] int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 87, normalized size of antiderivative = 2.64

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="fr
icas")
[Out] integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3*
a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arcsin(b*x + a)^2), x
)
```

Sympy [N/A]

Not integrable

Time = 3.24 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.88

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(-(a+bx-1)(a+bx+1))^{\frac{3}{2}}\operatorname{asin}^2(a+bx)}\,dx$$

```
[In] integrate(1/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**2,x)
```

```
[Out] Integral(1/((-(a + b*x - 1)*(a + b*x + 1))**(3/2)*asin(a + b*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 6.53 (sec) , antiderivative size = 195, normalized size of antiderivative = 5.91

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)^2}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="ma
xima")
```

```
[Out] ((b^3*x^2 + 2*a*b^2*x + (a^2 - 1)*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqr
t(-b*x - a + 1))*integrate(2*(b*x + a)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 -
 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arctan2(b*x + a, sqrt(b*x
+ a + 1)*sqrt(-b*x - a + 1))), x) + 1)/((b^3*x^2 + 2*a*b^2*x + (a^2 - 1)*b)
*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

Giac [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin(bx+a)^2}\,dx$$

```
[In] integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx=\int \frac{1}{\mathrm{asin}\left(a+b\,x\right)^2\,{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

```
[In] int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)),x)
[Out] int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)), x)
```

3.338 $\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 46

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

```
[Out] 1/2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b/(c-c*(b*x+a)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {253, 223, 209, 4737}

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

```
[In] Int[ArcSin[a + b*x]/Sqrt[c - c*(a + b*x)^2],x]
```

```
[Out] (Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[c - c*(a + b*x)^2])
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 253

```
Int[((a_.) + (b_.)*(v_)^(n_))^(p_), x_Symbol] :> Dist[1/Coefficient[v, x, 1
], Subst[Int[(a + b*x^n)^p, x], x, v], x] /; FreeQ[{a, b, n, p}, x] && Line
arQ[v, x] && NeQ[v, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{c-cx^2}}\,dx, x, a+bx\right)}{b}\\ &= \frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{-c\left(-1+(a+bx)^2\right)}}$$

```
[In] Integrate[ArcSin[a + b*x]/Sqrt[c - c*(a + b*x)^2],x]
[Out] (Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[-(c*(-1 + (a + b*x)^2))
])
```

Maple [A] (verified)

Time = 0.95 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.74

method	result	size
default	$-\frac{\sqrt{-c(b^2x^2+2abx+a^2-1)}\,\sqrt{-b^2x^2-2abx-a^2+1}\,\arcsin(bx+a)^2}{2c(b^2x^2+2abx+a^2-1)b}$	80

```
[In] int(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2*(-c*(b^2*x^2+2*a*b*x+a^2-1))^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/c/(b
^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\arcsin\left(bx+a\right)}{\sqrt{-\left(bx+a\right)^2c+c}}\,dx$$

```
[In] integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c)*arcsin(b*x + a)/(b^2*c
*x^2 + 2*a*b*c*x + (a^2 - 1)*c), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \text{Timed out}$$

```
[In] integrate(asin(b*x+a)/(c-c*(b*x+a)**2)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 206 vs. $2(40) = 80$.

Time = 0.29 (sec) , antiderivative size = 206, normalized size of antiderivative = 4.48

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \frac{\sqrt{c}\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\sqrt{a^2b^2c^2-(a^2c-c)b^2c}} - \frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2c-c)b^2c}}\right)}{b\sqrt{c}} - \frac{\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2c-c)b^2c}}\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b\sqrt{c}}$$

```
[In] integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(c)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/sqrt(a^2
*b^2*c^2 - (a^2*c - c)*b^2*c) - arcsin(b*x + a)*arcsin(-(b^2*c*x + a*b*c)/s
qrt(a^2*b^2*c^2 - (a^2*c - c)*b^2*c))/(b*sqrt(c)) - arcsin(-(b^2*c*x + a*b*
c)/sqrt(a^2*b^2*c^2 - (a^2*c - c)*b^2*c))*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^
2 - (a^2 - 1)*b^2))/(b*sqrt(c))
```

Giac [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\arcsin(bx+a)}{\sqrt{-(bx+a)^2c+c}}\,dx$$

```
[In] integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(b*x + a)/sqrt(-(b*x + a)^2*c + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{\sqrt{c-c\,(a+b\,x)^2}}\,dx$$

```
[In] int(asin(a + b*x)/(c - c*(a + b*x)^2)^(1/2),x)
[Out] int(asin(a + b*x)/(c - c*(a + b*x)^2)^(1/2), x)
```

3.339 $\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)c-2abcx-b^2cx^2}}\,dx$

Optimal result

Integrand size = 36, antiderivative size = 46

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

```
[Out] 1/2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b/(c-c*(b*x+a)^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {4891, 4737}

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

```
[In] Int[ArcSin[a + b*x]/Sqrt[(1 - a^2)*c - 2*a*b*c*x - b^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[c - c*(a + b*x)^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4891

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/d, Subst[Int[(-C/d^2 + (C/d^2)*x^2)
^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\arcsin(x)}{\sqrt{c-cx^2}}\,dx, x, a+bx\right)}{b} \\
&= \frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.17

$$
\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx = \frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{-c\,(-1+a^2+2abx+b^2x^2)}}
$$

```
[In] Integrate[ArcSin[a + b*x]/Sqrt[(1 - a^2)*c - 2*a*b*c*x - b^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[-(c*(-1 + a^2 + 2*a*b*x
 + b^2*x^2))])
```

Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.74

method	result	size
default	$-\frac{\sqrt{-c(b^2x^2+2abx+a^2-1)}\,\sqrt{-b^2x^2-2abx-a^2+1}\,\arcsin(bx+a)^2}{2c(b^2x^2+2abx+a^2-1)b}$	80

```
[In] int(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x,method=_RETURNVE
RBOSE)
```

```
[Out] -1/2*(-c*(b^2*x^2+2*a*b*x+a^2-1))^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/c/(b
^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2
```

Fricas [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx = \int \frac{\arcsin\left(bx+a\right)}{\sqrt{-b^2cx^2-2\,abcx-(a^2-1)c}}\,dx$$

```
[In] integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c)*arcsin(b*x + a)/(b^2*c
*x^2 + 2*a*b*c*x + (a^2 - 1)*c), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx = \text{Timed out}$$

```
[In] integrate(asin(b*x+a)/((-a**2+1)*c-2*a*b*c*x-b**2*c*x**2)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 200 vs. $2(40) = 80$.

Time = 0.31 (sec) , antiderivative size = 200, normalized size of antiderivative = 4.35

$$\begin{aligned}\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx &= \frac{\sqrt{c}\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}} - \frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}}\right)}{b\sqrt{c}} \\ &\quad - \frac{\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}}\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b\sqrt{c}}\end{aligned}$$

```
[In] integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorithm
="maxima")
```

```
[Out] 1/2*sqrt(c)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/sqrt(a^2
*b^2*c^2 - (a^2 - 1)*b^2*c^2) - arcsin(b*x + a)*arcsin(-(b^2*c*x + a*b*c)/s
qrt(a^2*b^2*c^2 - (a^2 - 1)*b^2*c^2))/(b*sqrt(c)) - arcsin(-(b^2*c*x + a*b*
c)/sqrt(a^2*b^2*c^2 - (a^2 - 1)*b^2*c^2))*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^
2 - (a^2 - 1)*b^2))/(b*sqrt(c))
```

Giac [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx = \int \frac{\arcsin\left(bx+a\right)}{\sqrt{-b^2cx^2-2\,abcx-(a^2-1)c}}\,dx$$

```
[In] integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorithm
="giac")
[Out] integrate(arcsin(b*x + a)/sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{\sqrt{-c\,b^2\,x^2-2\,a\,c\,b\,x-c\,\left(a^2-1\right)}}\,dx$$

```
[In] int(asin(a + b*x)/(- c*(a^2 - 1) - b^2*c*x^2 - 2*a*b*c*x)^(1/2),x)
[Out] int(asin(a + b*x)/(- c*(a^2 - 1) - b^2*c*x^2 - 2*a*b*c*x)^(1/2), x)
```

3.340 $\int x^9(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 84

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{b\sqrt{1-c^2x^4}}{10c^5}-\frac{b\left(1-c^2x^4\right)^{3/2}}{15c^5}+\frac{b\left(1-c^2x^4\right)^{5/2}}{50c^5}+\frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)$$

```
[Out] -1/15*b*(-c^2*x^4+1)^(3/2)/c^5+1/50*b*(-c^2*x^4+1)^(5/2)/c^5+1/10*x^10*(a+b
*arcsin(c*x^2))+1/10*b*(-c^2*x^4+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 272, 45}

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)+\frac{b\left(1-c^2x^4\right)^{5/2}}{50c^5}-\frac{b\left(1-c^2x^4\right)^{3/2}}{15c^5}+\frac{b\sqrt{1-c^2x^4}}{10c^5}$$

```
[In] Int[x^9*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (b*Sqrt[1 - c^2*x^4])/(10*c^5) - (b*(1 - c^2*x^4)^(3/2))/(15*c^5) + (b*(1 -
 c^2*x^4)^(5/2))/(50*c^5) + (x^10*(a + b*ArcSin[c*x^2]))/10
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{10}b\int\frac{2cx^{11}}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{5}(bc)\int\frac{x^{11}}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{20}(bc)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x}}\,dx,x,x^4\right)\\
&= \frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)\\
&\quad -\frac{1}{20}(bc)\text{Subst}\left(\int\left(\frac{1}{c^4\sqrt{1-c^2x}}-\frac{2\sqrt{1-c^2x}}{c^4}+\frac{\left(1-c^2x\right)^{3/2}}{c^4}\right)\,dx,x,x^4\right)\\
&= \frac{b\sqrt{1-c^2x^4}}{10c^5}-\frac{b\left(1-c^2x^4\right)^{3/2}}{15c^5}+\frac{b\left(1-c^2x^4\right)^{5/2}}{50c^5}+\frac{1}{10}x^{10}\left(a+b\arcsin\left(cx^2\right)\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.71

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{150}\left(15ax^{10}+\frac{b\sqrt{1-c^2x^4}(8+4c^2x^4+3c^4x^8)}{c^5}+15bx^{10}\arcsin\left(cx^2\right)\right)$$

[In] Integrate[x^9*(a + b*ArcSin[c*x^2]),x]

[Out] (15*a*x^10 + (b*Sqrt[1 - c^2*x^4]*(8 + 4*c^2*x^4 + 3*c^4*x^8))/c^5 + 15*b*x^10*ArcSin[c*x^2])/150

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.85

method	result	size
default	$\frac{a\,x^{10}}{10}+b\left(\frac{x^{10}\arcsin\left(c\,x^2\right)}{10}-\frac{\left(c\,x^2-1\right)\left(c\,x^2+1\right)\left(3c^4x^8+4c^2x^4+8\right)}{150c^5\sqrt{-c^2x^4+1}}\right)$	71
parts	$\frac{a\,x^{10}}{10}+b\left(\frac{x^{10}\arcsin\left(c\,x^2\right)}{10}-\frac{\left(c\,x^2-1\right)\left(c\,x^2+1\right)\left(3c^4x^8+4c^2x^4+8\right)}{150c^5\sqrt{-c^2x^4+1}}\right)$	71

[In] int(x^9*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)

[Out] 1/10*a*x^10+b*(1/10*x^10*arcsin(c*x^2)-1/150/c^5*(c*x^2-1)*(c*x^2+1)*(3*c^4*x^8+4*c^2*x^4+8)/(-c^2*x^4+1)^(1/2))

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.77

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{15\,bc^5x^{10}\arcsin\left(cx^2\right)+15\,ac^5x^{10}+\left(3\,bc^4x^8+4\,bc^2x^4+8\,b\right)\sqrt{-c^2x^4+1}}{150\,c^5}$$

[In] integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="fricas")

[Out] 1/150*(15*b*c^5*x^10*arcsin(c*x^2) + 15*a*c^5*x^10 + (3*b*c^4*x^8 + 4*b*c^2*x^4 + 8*b)*sqrt(-c^2*x^4 + 1))/c^5

Sympy [A] (verification not implemented)

Time = 1.48 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.07

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \begin{cases} \frac{ax^{10}}{10}+\frac{bx^{10}\operatorname{asin}\left(cx^2\right)}{10}+\frac{bx^8\sqrt{-c^2x^4+1}}{50c}+\frac{2bx^4\sqrt{-c^2x^4+1}}{75c^3}+\frac{4b\sqrt{-c^2x^4+1}}{75c^5} & \text{for } c\neq 0 \\ \frac{ax^{10}}{10} & \text{otherwise} \end{cases}$$

```
[In] integrate(x**9*(a+b*asin(c*x**2)),x)
```

```
[Out] Piecewise((a*x**10/10 + b*x**10*asin(c*x**2)/10 + b*x**8*sqrt(-c**2*x**4 +
1)/(50*c) + 2*b*x**4*sqrt(-c**2*x**4 + 1)/(75*c**3) + 4*b*sqrt(-c**2*x**4 +
 1)/(75*c**5), Ne(c, 0)), (a*x**10/10, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.90

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{1}{10}\,ax^{10} + \frac{1}{150}\left(15\,x^{10}\arcsin\left(cx^2\right)+c\left(\frac{3\left(-c^2x^4+1\right)^{\frac{5}{2}}}{c^6}-\frac{10\left(-c^2x^4+1\right)^{\frac{3}{2}}}{c^6}+\frac{15\sqrt{-c^2x^4+1}}{c^6}\right)\right)b$$

```
[In] integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

```
[Out] 1/10*a*x^10 + 1/150*(15*x^10*arcsin(c*x^2) + c*(3*(-c^2*x^4 + 1)^(5/2)/c^6
- 10*(-c^2*x^4 + 1)^(3/2)/c^6 + 15*sqrt(-c^2*x^4 + 1)/c^6))*b
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.67

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{15\,acx^{10}+\left(\frac{15\left(c^2x^4-1\right)^2x^2\arcsin\left(cx^2\right)}{c^3}+\frac{30\left(c^2x^4-1\right)x^2\arcsin\left(cx^2\right)}{c^3}+\frac{15\,x^2\arcsin\left(cx^2\right)}{c^3}+\frac{3\left(c^2x^4-1\right)^2\sqrt{-c^2x^4+1}}{c^4}-\frac{10\left(-c^2x^4+\right.}{c^4}}{150\,c}$$

```
[In] integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

[Out] 1/150*(15*a*c*x^10 + (15*(c^2*x^4 - 1)^2*x^2*arcsin(c*x^2)/c^3 + 30*(c^2*x^4 - 1)*x^2*arcsin(c*x^2)/c^3 + 15*x^2*arcsin(c*x^2)/c^3 + 3*(c^2*x^4 - 1)^2*sqrt(-c^2*x^4 + 1)/c^4 - 10*(-c^2*x^4 + 1)^(3/2)/c^4 + 15*sqrt(-c^2*x^4 + 1)/c^4)*b)/c

Mupad [F(-1)]

Timed out.

$$\int x^9(a+b\arcsin\left(cx^2\right))\,dx=\int x^9\,\left(a+b\,\mathrm{asin}\left(c\,x^2\right)\right)\,dx$$

[In] int(x^9*(a + b*asin(c*x^2)),x)

[Out] int(x^9*(a + b*asin(c*x^2)), x)

3.341 $\int x^7(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 82

$$\int x^7(a+b\arcsin(cx^2))\,dx=\frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}-\frac{3b\arcsin(cx^2)}{64c^4}+\frac{1}{8}x^8(a+b\arcsin(cx^2))$$

```
[Out] -3/64*b*arcsin(c*x^2)/c^4+1/8*x^8*(a+b*arcsin(c*x^2))+3/64*b*x^2*(-c^2*x^4+
1)^(1/2)/c^3+1/32*b*x^6*(-c^2*x^4+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {4926, 12, 281, 327, 222}

$$\int x^7(a+b\arcsin(cx^2))\,dx=\frac{1}{8}x^8(a+b\arcsin(cx^2))-\frac{3b\arcsin(cx^2)}{64c^4}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}+\frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}$$

```
[In] Int[x^7*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (3*b*x^2*Sqrt[1 - c^2*x^4])/(64*c^3) + (b*x^6*Sqrt[1 - c^2*x^4])/(32*c) - (
3*b*ArcSin[c*x^2])/(64*c^4) + (x^8*(a + b*ArcSin[c*x^2]))/8
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 281

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Dist[1/k, Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x, x
^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{8}b\int\frac{2cx^9}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{4}(bc)\int\frac{x^9}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{8}(bc)\text{Subst}\left(\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx,x,x^2\right)\\
&= \frac{bx^6\sqrt{1-c^2x^4}}{32c}+\frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)-\frac{(3b)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx,x,x^2\right)}{32c}\\
&= \frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}+\frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)-\frac{(3b)\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x^2}}\,dx,x,x^2\right)}{64c^3}\\
&= \frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}-\frac{3b\arcsin\left(cx^2\right)}{64c^4}+\frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.06

$$\int x^7 \left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^8}{8}+\frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}-\frac{3b\arcsin\left(cx^2\right)}{64c^4}+\frac{1}{8}bx^8\arcsin\left(cx^2\right)$$

```
[In] Integrate[x^7*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (a*x^8)/8 + (3*b*x^2*Sqrt[1 - c^2*x^4])/(64*c^3) + (b*x^6*Sqrt[1 - c^2*x^4]
)/(32*c) - (3*b*ArcSin[c*x^2])/(64*c^4) + (b*x^8*ArcSin[c*x^2])/8
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.16

method	result	size
default	$\frac{a\,x^{8}}{8}+\frac{b\,x^{8}\arcsin\left(c\,x^{2}\right)}{8}+\frac{b\,x^{6}\sqrt{-c^{2}x^{4}+1}}{32c}+\frac{3b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{64c^{3}}-\frac{3b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{64c^{3}\sqrt{c^{2}}}$	95
parts	$\frac{a\,x^{8}}{8}+\frac{b\,x^{8}\arcsin\left(c\,x^{2}\right)}{8}+\frac{b\,x^{6}\sqrt{-c^{2}x^{4}+1}}{32c}+\frac{3b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{64c^{3}}-\frac{3b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{64c^{3}\sqrt{c^{2}}}$	95

```
[In] int(x^7*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*a*x^8+1/8*b*x^8*arcsin(c*x^2)+1/32*b*x^6*(-c^2*x^4+1)^(1/2)/c+3/64*b*x^
2*(-c^2*x^4+1)^(1/2)/c^3-3/64*b/c^3/(c^2)^(1/2)*arctan((c^2)^(1/2)*x^2/(-c^
2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.79

$$\int x^7 \left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{8\,ac^4x^8+\left(8\,bc^4x^8-3\,b\right)\arcsin\left(cx^2\right)+\left(2\,bc^3x^6+3\,bcx^2\right)\sqrt{-c^2x^4+1}}{64\,c^4}$$

```
[In] integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

```
[Out] 1/64*(8*a*c^4*x^8 + (8*b*c^4*x^8 - 3*b)*arcsin(c*x^2) + (2*b*c^3*x^6 + 3*b*
c*x^2)*sqrt(-c^2*x^4 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.94 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.04

$$\int x^7 \left(a + b \arcsin \left(cx^2\right)\right) \, dx = \begin{cases} \frac{ax^8}{8} + \frac{bx^8 \operatorname{asin}\left(cx^2\right)}{8} + \frac{bx^6\sqrt{-c^2x^4+1}}{32c} + \frac{3bx^2\sqrt{-c^2x^4+1}}{64c^3} - \frac{3b \operatorname{asin}\left(cx^2\right)}{64c^4} & \text{for } c \neq 0 \\ \frac{ax^8}{8} & \text{otherwise} \end{cases}$$

```
[In] integrate(x**7*(a+b*asin(c*x**2)),x)
```

```
[Out] Piecewise((a*x**8/8 + b*x**8*asin(c*x**2)/8 + b*x**6*sqrt(-c**2*x**4 + 1)/(
32*c) + 3*b*x**2*sqrt(-c**2*x**4 + 1)/(64*c**3) - 3*b*asin(c*x**2)/(64*c**4
), Ne(c, 0)), (a*x**8/8, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.59

$$\int x^7 \left(a + b \arcsin \left(cx^2\right)\right) \, dx = \frac{1}{8}\, ax^8 + \frac{1}{64}\left(8\,x^8 \arcsin\left(cx^2\right) + c\left(\frac{\frac{5\sqrt{-c^2x^4+1}c^2}{x^2} + \frac{3\left(-c^2x^4+1\right)^{\frac{3}{2}}}{x^6}}{c^8 - \frac{2\left(c^2x^4-1\right)c^6}{x^4} + \frac{\left(c^2x^4-1\right)^2c^4}{x^8}} + \frac{3\,\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)}{c^5}\right)\right)b$$

```
[In] integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

```
[Out] 1/8*a*x^8 + 1/64*(8*x^8*arcsin(c*x^2) + c*((5*sqrt(-c^2*x^4 + 1)*c^2/x^2 +
3*(-c^2*x^4 + 1)^(3/2)/x^6)/(c^8 - 2*(c^2*x^4 - 1)*c^6/x^4 + (c^2*x^4 - 1)^
2*c^4/x^8) + 3*arctan(sqrt(-c^2*x^4 + 1)/(c*x^2))/c^5))*b
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.34

$$\int x^7 \left(a + b \arcsin \left(cx^2\right)\right) \, dx = \frac{8\,acx^8 - \left(\frac{2\left(-c^2x^4+1\right)^{\frac{3}{2}}x^2}{c^2} - \frac{5\sqrt{-c^2x^4+1}x^2}{c^2} - \frac{8\left(c^2x^4-1\right)^2\arcsin\left(cx^2\right)}{c^3} - \frac{16\left(c^2x^4-1\right)\arcsin\left(cx^2\right)}{c^3} - \frac{5\,\arcsin\left(cx^2\right)}{c^3}\right)b}{64\,c}$$

```
[In] integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

```
[Out] 1/64*(8*a*c*x^8 - (2*(-c^2*x^4 + 1)^(3/2)*x^2/c^2 - 5*sqrt(-c^2*x^4 + 1)*x^
2/c^2 - 8*(c^2*x^4 - 1)^2*arcsin(c*x^2)/c^3 - 16*(c^2*x^4 - 1)*arcsin(c*x^2
)/c^3 - 5*arcsin(c*x^2)/c^3)*b)/c
```

Mupad [F(-1)]

Timed out.

$$\int x^7(a+b\arcsin(cx^2)) \, dx = \int x^7 \left(a+b\,\mathrm{asin}\left(c\,x^2\right)\right) \, dx$$

```
[In] int(x^7*(a + b*asin(c*x^2)),x)
```

```
[Out] int(x^7*(a + b*asin(c*x^2)), x)
```

3.342 $\int x^5(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 62

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{b\sqrt{1-c^2x^4}}{6c^3}-\frac{b\left(1-c^2x^4\right)^{3/2}}{18c^3}+\frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)$$

```
[Out] -1/18*b*(-c^2*x^4+1)^(3/2)/c^3+1/6*x^6*(a+b*arcsin(c*x^2))+1/6*b*(-c^2*x^4+
1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 272, 45}

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)-\frac{b\left(1-c^2x^4\right)^{3/2}}{18c^3}+\frac{b\sqrt{1-c^2x^4}}{6c^3}$$

```
[In] Int[x^5*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (b*Sqrt[1 - c^2*x^4])/(6*c^3) - (b*(1 - c^2*x^4)^(3/2))/(18*c^3) + (x^6*(a
+ b*ArcSin[c*x^2]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{6}b\int\frac{2cx^7}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{3}(bc)\int\frac{x^7}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{12}(bc)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}\,dx,x,x^4\right)\\
&= \frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{12}(bc)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)\,dx,x,x^4\right)\\
&= \frac{b\sqrt{1-c^2x^4}}{6c^3}-\frac{b(1-c^2x^4)^{3/2}}{18c^3}+\frac{1}{6}x^6\left(a+b\arcsin\left(cx^2\right)\right)\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.13

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^6}{6}+\frac{b\sqrt{1-c^2x^4}}{9c^3}+\frac{bx^4\sqrt{1-c^2x^4}}{18c}+\frac{1}{6}bx^6\arcsin\left(cx^2\right)$$

```
[In] Integrate[x^5*(a + b*ArcSin[c*x^2]),x]
[Out] (a*x^6)/6 + (b*Sqrt[1 - c^2*x^4])/(9*c^3) + (b*x^4*Sqrt[1 - c^2*x^4])/(18*c
) + (b*x^6*ArcSin[c*x^2])/6
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00

method	result	size
default	$\frac{a\,x^{6}}{6}+b\left(\frac{x^{6}\arcsin\left(c\,x^{2}\right)}{6}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(c^{2}x^{4}+2\right)}{18c^{3}\sqrt{-c^{2}x^{4}+1}}\right)$	62
parts	$\frac{a\,x^{6}}{6}+b\left(\frac{x^{6}\arcsin\left(c\,x^{2}\right)}{6}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(c^{2}x^{4}+2\right)}{18c^{3}\sqrt{-c^{2}x^{4}+1}}\right)$	62

```
[In] int(x^5*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a*x^6+b*(1/6*x^6*arcsin(c*x^2)-1/18/c^3*(c*x^2-1)*(c*x^2+1)*(c^2*x^4+2)
/(-c^2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.89

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{3\,bc^3x^6\arcsin\left(cx^2\right)+3\,ac^3x^6+\left(bc^2x^4+2\,b\right)\sqrt{-c^2x^4+1}}{18\,c^3}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

```
[Out] 1/18*(3*b*c^3*x^6*arcsin(c*x^2) + 3*a*c^3*x^6 + (b*c^2*x^4 + 2*b)*sqrt(-c^2
*x^4 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.47 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.05

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\begin{cases}\frac{ax^6}{6}+\frac{bx^6\operatorname{asin}\left(cx^2\right)}{6}+\frac{bx^4\sqrt{-c^2x^4+1}}{18c}+\frac{b\sqrt{-c^2x^4+1}}{9c^3} & \text{for}\ c\neq 0\\ \frac{ax^6}{6} & \text{otherwise}\end{cases}$$

```
[In] integrate(x**5*(a+b*asin(c*x**2)),x)
```

```
[Out] Piecewise((a*x**6/6 + b*x**6*asin(c*x**2)/6 + b*x**4*sqrt(-c**2*x**4 + 1)/(
18*c) + b*sqrt(-c**2*x**4 + 1)/(9*c**3), Ne(c, 0)), (a*x**6/6, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.95

$$\int x^5(a+b\arcsin(cx^2))\,dx = \frac{1}{6}ax^6 + \frac{1}{18}\left(3x^6\arcsin(cx^2) - c\left(\frac{(-c^2x^4+1)^{\frac{3}{2}}}{c^4} - \frac{3\sqrt{-c^2x^4+1}}{c^4}\right)\right)b$$

```
[In] integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
[Out] 1/6*a*x^6 + 1/18*(3*x^6*arcsin(c*x^2) - c*((-c^2*x^4 + 1)^(3/2)/c^4 - 3*sqr
t(-c^2*x^4 + 1)/c^4))*b
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.40

$$\int x^5(a+b\arcsin(cx^2))\,dx = \frac{3\,acx^6 + \left(\frac{3\,(c^2x^4-1)x^2\arcsin(cx^2)}{c} + \frac{3\,x^2\arcsin(cx^2)}{c} - \frac{(-c^2x^4+1)^{\frac{3}{2}}}{c^2} + \frac{3\sqrt{-c^2x^4+1}}{c^2}\right)b}{18\,c}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="giac")
[Out] 1/18*(3*a*c*x^6 + (3*(c^2*x^4 - 1)*x^2*arcsin(c*x^2)/c + 3*x^2*arcsin(c*x^2
)/c - (-c^2*x^4 + 1)^(3/2)/c^2 + 3*sqrt(-c^2*x^4 + 1)/c^2)*b)/c
```

Mupad [F(-1)]

Timed out.

$$\int x^5(a+b\arcsin(cx^2))\,dx = \int x^5\,\left(a+b\,\mathrm{asin}\left(c\,x^2\right)\right)\,dx$$

```
[In] int(x^5*(a + b*asin(c*x^2)),x)
[Out] int(x^5*(a + b*asin(c*x^2)), x)
```

3.343 $\int x^3(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 57

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{bx^2\sqrt{1-c^2x^4}}{8c}-\frac{b\arcsin(cx^2)}{8c^2}+\frac{1}{4}x^4(a+b\arcsin(cx^2))$$

```
[Out] -1/8*b*arcsin(c*x^2)/c^2+1/4*x^4*(a+b*arcsin(c*x^2))+1/8*b*x^2*(-c^2*x^4+1)
^(1/2)/c
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {4926, 12, 281, 327, 222}

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{1}{4}x^4(a+b\arcsin(cx^2))-\frac{b\arcsin(cx^2)}{8c^2}+\frac{bx^2\sqrt{1-c^2x^4}}{8c}$$

```
[In] Int[x^3*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (b*x^2*Sqrt[1 - c^2*x^4])/(8*c) - (b*ArcSin[c*x^2])/(8*c^2) + (x^4*(a + b*A
rcSin[c*x^2]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 281

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Dist[1/k, Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x, x
^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{4}x^4\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{4}b\int\frac{2cx^5}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{4}x^4\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{2}(bc)\int\frac{x^5}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{4}x^4\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{4}(bc)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx,x,x^2\right)\\
&= \frac{bx^2\sqrt{1-c^2x^4}}{8c}+\frac{1}{4}x^4\left(a+b\arcsin\left(cx^2\right)\right)-\frac{b\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x^2}}\,dx,x,x^2\right)}{8c}\\
&= \frac{bx^2\sqrt{1-c^2x^4}}{8c}-\frac{b\arcsin\left(cx^2\right)}{8c^2}+\frac{1}{4}x^4\left(a+b\arcsin\left(cx^2\right)\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.09

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^4}{4}+\frac{bx^2\sqrt{1-c^2x^4}}{8c}-\frac{b\arcsin\left(cx^2\right)}{8c^2}+\frac{1}{4}bx^4\arcsin\left(cx^2\right)$$

```
[In] Integrate[x^3*(a + b*ArcSin[c*x^2]),x]
[Out] (a*x^4)/4 + (b*x^2*Sqrt[1 - c^2*x^4])/(8*c) - (b*ArcSin[c*x^2])/(8*c^2) + (
b*x^4*ArcSin[c*x^2])/4
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.30

method	result	size
default	$\frac{a\,x^4}{4}+\frac{b\,x^4\arcsin\left(c\,x^2\right)}{4}+\frac{b\,x^2\sqrt{-c^2x^4+1}}{8c}-\frac{b\arctan\left(\frac{\sqrt{c^2}\,x^2}{\sqrt{-c^2x^4+1}}\right)}{8c\sqrt{c^2}}$	74
parts	$\frac{a\,x^4}{4}+\frac{b\,x^4\arcsin\left(c\,x^2\right)}{4}+\frac{b\,x^2\sqrt{-c^2x^4+1}}{8c}-\frac{b\arctan\left(\frac{\sqrt{c^2}\,x^2}{\sqrt{-c^2x^4+1}}\right)}{8c\sqrt{c^2}}$	74

```
[In] int(x^3*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
[Out] 1/4*a*x^4+1/4*b*x^4*arcsin(c*x^2)+1/8*b*x^2*(-c^2*x^4+1)^(1/2)/c-1/8*b/c/(c
^2)^(1/2)*arctan((c^2)^(1/2)*x^2/(-c^2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.93

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{2\,ac^2x^4+\sqrt{-c^2x^4+1}bcx^2+\left(2\,bc^2x^4-b\right)\arcsin\left(cx^2\right)}{8\,c^2}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
[Out] 1/8*(2*a*c^2*x^4 + sqrt(-c^2*x^4 + 1)*b*c*x^2 + (2*b*c^2*x^4 - b)*arcsin(c*
x^2))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.05

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\begin{cases}\frac{ax^4}{4}+\frac{bx^4\operatorname{asin}\left(cx^2\right)}{4}+\frac{bx^2\sqrt{-c^2x^4+1}}{8c}-\frac{b\operatorname{asin}\left(cx^2\right)}{8c^2} & \text{for } c\neq 0\\ \frac{ax^4}{4} & \text{otherwise}\end{cases}$$

```
[In] integrate(x**3*(a+b*asin(c*x**2)),x)
```

```
[Out] Piecewise((a*x**4/4 + b*x**4*asin(c*x**2)/4 + b*x**2*sqrt(-c**2*x**4 + 1)/(
8*c) - b*asin(c*x**2)/(8*c**2), Ne(c, 0)), (a*x**4/4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.54

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx$$
$$=\frac{1}{4}\,ax^4+\frac{1}{8}\left(2\,x^4\arcsin\left(cx^2\right)+c\left(\frac{\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)}{c^3}+\frac{\sqrt{-c^2x^4+1}}{\left(c^4-\frac{(c^2x^4-1)c^2}{x^4}\right)x^2}\right)\right)b$$

```
[In] integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4 + 1/8*(2*x^4*arcsin(c*x^2) + c*(arctan(sqrt(-c^2*x^4 + 1)/(c*x^2)
)/c^3 + sqrt(-c^2*x^4 + 1)/((c^4 - (c^2*x^4 - 1)*c^2/x^4)*x^2)))*b
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.04

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{2\,acx^4+\frac{\left(\sqrt{-c^2x^4+1}cx^2+2\,(c^2x^4-1)\arcsin\left(cx^2\right)+\arcsin\left(cx^2\right)\right)b}{c}}{8\,c}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

```
[Out] 1/8*(2*a*c*x^4 + (sqrt(-c^2*x^4 + 1)*c*x^2 + 2*(c^2*x^4 - 1)*arcsin(c*x^2)
+ arcsin(c*x^2))*b/c)/c
```

Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int x^3\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{a\,x^4}{4}+\frac{b\,\left(\frac{\mathrm{asin}\left(c\,x^2\right)\,\left(2\,c^2\,x^4-1\right)}{4}+\frac{c\,x^2\,\sqrt{1-c^2\,x^4}}{4}\right)}{2\,c^2}$$

```
[In] int(x^3*(a + b*asin(c*x^2)),x)
```

```
[Out] (a*x^4)/4 + (b*((asin(c*x^2)*(2*c^2*x^4 - 1))/4 + (c*x^2*(1 - c^2*x^4)^(1/2
))/4))/(2*c^2)
```

3.344 $\int x(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 12, antiderivative size = 45

$$\int x(a+b\arcsin(cx^2))\,dx=\frac{ax^2}{2}+\frac{b\sqrt{1-c^2x^4}}{2c}+\frac{1}{2}bx^2\arcsin(cx^2)$$

```
[Out] 1/2*a*x^2+1/2*b*x^2*arcsin(c*x^2)+1/2*b*(-c^2*x^4+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {6847, 4715, 267}

$$\int x(a+b\arcsin(cx^2))\,dx=\frac{ax^2}{2}+\frac{1}{2}bx^2\arcsin(cx^2)+\frac{b\sqrt{1-c^2x^4}}{2c}$$

```
[In] Int[x*(a + b*ArcSin[c*x^2]),x]
[Out] (a*x^2)/2 + (b*Sqrt[1 - c^2*x^4])/(2*c) + (b*x^2*ArcSin[c*x^2])/2
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}\text{Subst}\left(\int (a+b\arcsin(cx))\,dx, x, x^2\right)\\
&= \frac{ax^2}{2}+\frac{1}{2}b\text{Subst}\left(\int \arcsin(cx)\,dx, x, x^2\right)\\
&= \frac{ax^2}{2}+\frac{1}{2}bx^2\arcsin\left(cx^2\right)-\frac{1}{2}(bc)\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x^2}}\,dx, x, x^2\right)\\
&= \frac{ax^2}{2}+\frac{b\sqrt{1-c^2x^4}}{2c}+\frac{1}{2}bx^2\arcsin\left(cx^2\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.96

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^2}{2}+\frac{1}{2}b\left(\frac{\sqrt{1-c^2x^4}}{c}+x^2\arcsin\left(cx^2\right)\right)$$

```
[In] Integrate[x*(a + b*ArcSin[c*x^2]),x]
[Out] (a*x^2)/2 + (b*(Sqrt[1 - c^2*x^4]/c + x^2*ArcSin[c*x^2]))/2
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

method	result	size
parts	$\frac{a\,x^2}{2}+\frac{b\left(c\,x^2\arcsin\left(c\,x^2\right)+\sqrt{-c^2x^4+1}\right)}{2c}$	38
derivativedivides	$\frac{c\,x^2a+b\left(c\,x^2\arcsin\left(c\,x^2\right)+\sqrt{-c^2x^4+1}\right)}{2c}$	39
default	$\frac{c\,x^2a+b\left(c\,x^2\arcsin\left(c\,x^2\right)+\sqrt{-c^2x^4+1}\right)}{2c}$	39

```
[In] int(x*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
[Out] 1/2*a*x^2+1/2*b/c*(c*x^2*arcsin(c*x^2)+(-c^2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{bcx^2\arcsin\left(cx^2\right)+acx^2+\sqrt{-c^2x^4+1}b}{2\,c}$$

```
[In] integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
[Out] 1/2*(b*c*x^2*arcsin(c*x^2) + a*c*x^2 + sqrt(-c^2*x^4 + 1)*b)/c
```

Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.93

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\begin{cases}\frac{ax^2}{2}+\frac{bx^2\operatorname{asin}\left(cx^2\right)}{2}+\frac{b\sqrt{-c^2x^4+1}}{2c} & \text{for } c\neq 0\\ \frac{ax^2}{2} & \text{otherwise}\end{cases}$$

```
[In] integrate(x*(a+b*asin(c*x**2)),x)
[Out] Piecewise((a*x**2/2 + b*x**2*asin(c*x**2)/2 + b*sqrt(-c**2*x**4 + 1)/(2*c),
 Ne(c, 0)), (a*x**2/2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.82

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{2}\,ax^2+\frac{\left(cx^2\arcsin\left(cx^2\right)+\sqrt{-c^2x^4+1}\right)b}{2\,c}$$

```
[In] integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
[Out] 1/2*a*x^2 + 1/2*(c*x^2*arcsin(c*x^2) + sqrt(-c^2*x^4 + 1))*b/c
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

$$\int x(a+b\arcsin(cx^2))\,dx = \frac{acx^2+(cx^2\arcsin(cx^2)+\sqrt{-c^2x^4+1})b}{2c}$$

```
[In] integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="giac")
[Out] 1/2*(a*c*x^2 + (c*x^2*arcsin(c*x^2) + sqrt(-c^2*x^4 + 1))*b)/c
```

Mupad [B] (verification not implemented)

Time = 0.38 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.82

$$\int x(a+b\arcsin(cx^2))\,dx = \frac{a\,x^2}{2}+\frac{b\,\sqrt{1-c^2\,x^4}}{2\,c}+\frac{b\,x^2\,\mathrm{asin}(c\,x^2)}{2}$$

```
[In] int(x*(a + b*asin(c*x^2)),x)
[Out] (a*x^2)/2 + (b*(1 - c^2*x^4)^(1/2))/(2*c) + (b*x^2*asin(c*x^2))/2
```

3.345 $\int \frac{a+b\arcsin(cx^2)}{x}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 69

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = -\frac{1}{4}ib\arcsin\left(cx^2\right)^2+\frac{1}{2}b\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin(cx^2)}\right) + a\log(x)-\frac{1}{4}ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^2)}\right)$$

```
[Out] -1/4*I*b*arcsin(c*x^2)^2+1/2*b*arcsin(c*x^2)*ln(1-(I*c*x^2+(-c^2*x^4+1)^(1/
2))^2)+a*ln(x)-1/4*I*b*polylog(2,(I*c*x^2+(-c^2*x^4+1)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {6874, 4914, 3798, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = a\log(x)-\frac{1}{4}ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^2)}\right) -\frac{1}{4}ib\arcsin\left(cx^2\right)^2+\frac{1}{2}b\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin(cx^2)}\right)$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x,x]
```

```
[Out] (-1/4*I)*b*ArcSin[c*x^2]^2 + (b*ArcSin[c*x^2]*Log[1 - E^((2*I)*ArcSin[c*x^2
])])/2 + a*Log[x] - (I/4)*b*PolyLog[2, E^((2*I)*ArcSin[c*x^2])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4914

```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Dist[1/p, Subst[Int[x^
n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a}{x}+\frac{b\arcsin\left(cx^2\right)}{x}\right) dx \\
&= a\log(x)+b\int \frac{\arcsin\left(cx^2\right)}{x}\,dx \\
&= a\log(x)+\frac{1}{2}b\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin\left(cx^2\right)\right) \\
&= -\frac{1}{4}ib\arcsin\left(cx^2\right)^2+a\log(x)-(ib)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx,x,\arcsin\left(cx^2\right)\right) \\
&= -\frac{1}{4}ib\arcsin\left(cx^2\right)^2+\frac{1}{2}b\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin\left(cx^2\right)}\right) \\
&\quad +a\log(x)-\frac{1}{2}b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx,x,\arcsin\left(cx^2\right)\right)
\end{aligned}$$

$$= -\frac{1}{4}ib\arcsin\left(cx^2\right)^2 + \frac{1}{2}b\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin(cx^2)}\right) + a\log(x) + \frac{1}{4}(ib)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx^2)}\right)$$

$$= -\frac{1}{4}ib\arcsin\left(cx^2\right)^2 + \frac{1}{2}b\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin(cx^2)}\right) + a\log(x) - \frac{1}{4}ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx^2)}\right)$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.93

$$\int\frac{a+b\arcsin\left(cx^2\right)}{x}\,dx = a\log(x) + \frac{1}{2}b\left(\arcsin\left(cx^2\right)\log\left(1-e^{2i\arcsin(cx^2)}\right) - \frac{1}{2}i\left(\arcsin\left(cx^2\right)^2 + \text{PolyLog}\left(2, e^{2i\arcsin(cx^2)}\right)\right)\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x,x]
[Out] a*Log[x] + (b*(ArcSin[c*x^2]*Log[1 - E^((2*I)*ArcSin[c*x^2])] - (I/2)*(ArcS
in[c*x^2]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x^2])])))/2
```

Maple [F]

$$\int\frac{a+b\arcsin\left(c\,x^2\right)}{x}dx$$

```
[In] int((a+b*arcsin(c*x^2))/x,x)
[Out] int((a+b*arcsin(c*x^2))/x,x)
```

Fricas [F]

$$\int\frac{a+b\arcsin\left(cx^2\right)}{x}\,dx = \int\frac{b\arcsin\left(cx^2\right)+a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x^2) + a)/x, x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = \int \frac{a+b\operatorname{asin}(cx^2)}{x}\,dx$$

```
[In] integrate((a+b*asin(c*x**2))/x,x)
[Out] Integral((a + b*asin(c*x**2))/x, x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = \int \frac{b\arcsin(cx^2)+a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x,x, algorithm="maxima")
[Out] b*integrate(arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1))/x, x) + a*log(
x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = \int \frac{b\arcsin(cx^2)+a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^2) + a)/x, x)
```

Mupad [B] (verification not implemented)

Time = 0.45 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.83

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = a\ln(x) - \frac{b\operatorname{asin}(c\,x^2)^2\,1\mathrm{i}}{4} - \frac{b\operatorname{polylog}\left(2,\mathrm{e}^{\operatorname{asin}(c\,x^2)\,2\mathrm{i}}\right)\,1\mathrm{i}}{4} + \frac{b\ln\left(1-\mathrm{e}^{\operatorname{asin}(c\,x^2)\,2\mathrm{i}}\right)\,\operatorname{asin}(c\,x^2)}{2}$$

```
[In] int((a + b*asin(c*x^2))/x,x)
[Out] a*log(x) - (b*asin(c*x^2)^2*1i)/4 - (b*polylog(2, exp(asin(c*x^2)*2i))*1i)/
4 + (b*log(1 - exp(asin(c*x^2)*2i))*asin(c*x^2))/2
```

3.346 $\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 39

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a+b\arcsin(cx^2)}{2x^2} - \frac{1}{2}bc\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[Out] 1/2*(-a-b*arcsin(c*x^2))/x^2-1/2*b*c*arctanh((-c^2*x^4+1)^(1/2))
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {4926, 12, 272, 65, 214}

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a+b\arcsin(cx^2)}{2x^2} - \frac{1}{2}bc\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^3,x]
```

```
[Out] -1/2*(a + b*ArcSin[c*x^2])/x^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^4]])/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{2x^2}+\frac{1}{2}b\int\frac{2c}{x\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{2x^2}+(bc)\int\frac{1}{x\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{2x^2}+\frac{1}{4}(bc)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^4\right)\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{2x^2}-\frac{b\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^4}\right)}{2c}\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{2x^2}-\frac{1}{2}bc\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.13

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{b\arcsin(cx^2)}{2x^2} - \frac{1}{2}b\text{carctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^3,x]
[Out] -1/2*a/x^2 - (b*ArcSin[c*x^2])/(2*x^2) - (b*c*ArcTanh[Sqrt[1 - c^2*x^4]])/2
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

method	result	size
default	$-\frac{a}{2x^2}+b\left(-\frac{\arcsin(c\,x^2)}{2x^2}-\frac{c\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)$	38
parts	$-\frac{a}{2x^2}+b\left(-\frac{\arcsin(c\,x^2)}{2x^2}-\frac{c\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)$	38

```
[In] int((a+b*arcsin(c*x^2))/x^3,x,method=_RETURNVERBOSE)
[Out] -1/2*a/x^2+b*(-1/2/x^2*arcsin(c*x^2)-1/2*c*arctanh(1/(-c^2*x^4+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.56

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{bcx^2\log\left(\sqrt{-c^2x^4+1}+1\right) - bcx^2\log\left(\sqrt{-c^2x^4+1}-1\right) + 2\,b\arcsin(cx^2) + 2\,a}{4\,x^2}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="fricas")
[Out] -1/4*(b*c*x^2*log(sqrt(-c^2*x^4 + 1) + 1) - b*c*x^2*log(sqrt(-c^2*x^4 + 1)
- 1) + 2*b*arcsin(c*x^2) + 2*a)/x^2
```

Sympy [A] (verification not implemented)

Time = 1.18 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.38

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx=-\frac{a}{2x^2}+bc\left(\begin{cases}-\frac{\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{2} & \text{for } \frac{1}{|c^2x^4|}>1\\ \frac{i\operatorname{asin}\left(\frac{1}{cx^2}\right)}{2} & \text{otherwise}\end{cases}\right)-\frac{b\operatorname{asin}(cx^2)}{2x^2}$$

```
[In] integrate((a+b*asin(c*x**2))/x**3,x)
[Out] -a/(2*x**2) + b*c*Piecewise((-acosh(1/(c*x**2))/2, 1/Abs(c**2*x**4) > 1), (
I*asin(1/(c*x**2))/2, True)) - b*asin(c*x**2)/(2*x**2)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.46

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{1}{4}\left(c\left(\log\left(\sqrt{-c^2x^4+1}+1\right)-\log\left(\sqrt{-c^2x^4+1}-1\right)\right)+\frac{2\arcsin(cx^2)}{x^2}\right)b-\frac{a}{2\,x^2}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="maxima")
[Out] -1/4*(c*(log(sqrt(-c^2*x^4 + 1) + 1) - log(sqrt(-c^2*x^4 + 1) - 1)) + 2*arc
sin(c*x^2)/x^2)*b - 1/2*a/x^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 354 vs. 2(33) = 66.

Time = 0.32 (sec) , antiderivative size = 354, normalized size of antiderivative = 9.08

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{\frac{\sqrt{-c^2x^4+1}bc^3x^2\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{bc^3x^2\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{\sqrt{-c^2x^4+1}ac^3x^2}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{ac^3x^2}{\left(\sqrt{-c^2x^4+1}+1\right)^2}-\frac{2\sqrt{-c^2x^4+1}bc^2\log(x^2|c|)}{\sqrt{-c^2x^4+1}+1}+\frac{2\sqrt{-c^2x}\cdots}{\cdots}}{\cdots}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="giac")
[Out] -1/4*(sqrt(-c^2*x^4 + 1)*b*c^3*x^2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2
 + b*c^3*x^2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + sqrt(-c^2*x^4 + 1)*
```

```
a*c^3*x^2/(sqrt(-c^2*x^4 + 1) + 1)^2 + a*c^3*x^2/(sqrt(-c^2*x^4 + 1) + 1)^2
 - 2*sqrt(-c^2*x^4 + 1)*b*c^2*log(x^2*abs(c))/(sqrt(-c^2*x^4 + 1) + 1) + 2*
sqrt(-c^2*x^4 + 1)*b*c^2*log(sqrt(-c^2*x^4 + 1) + 1)/(sqrt(-c^2*x^4 + 1) +
1) - 2*b*c^2*log(x^2*abs(c))/(sqrt(-c^2*x^4 + 1) + 1) + 2*b*c^2*log(sqrt(-c
^2*x^4 + 1) + 1)/(sqrt(-c^2*x^4 + 1) + 1) + sqrt(-c^2*x^4 + 1)*b*c*arcsin(c
*x^2)/x^2 + b*c*arcsin(c*x^2)/x^2 + sqrt(-c^2*x^4 + 1)*a*c/x^2 + a*c/x^2)/c
```

Mupad [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin (cx^2)}{x^3}\,dx=-\frac{a}{2\,x^2}-\frac{b\,c\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^4}}\right)}{2}-\frac{b\,\mathrm{asin}(c\,x^2)}{2\,x^2}$$

```
[In] int((a + b*asin(c*x^2))/x^3,x)
```

```
[Out] - a/(2*x^2) - (b*c*atanh(1/(1 - c^2*x^4)^(1/2)))/2 - (b*asin(c*x^2))/(2*x^2
)
```

3.347 $\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 41

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx=-\frac{bc\sqrt{1-c^2x^4}}{4x^2}-\frac{a+b\arcsin(cx^2)}{4x^4}$$

```
[Out] 1/4*(-a-b*arcsin(c*x^2))/x^4-1/4*b*c*(-c^2*x^4+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 270}

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx=-\frac{a+b\arcsin(cx^2)}{4x^4}-\frac{bc\sqrt{1-c^2x^4}}{4x^2}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^5,x]
```

```
[Out] -1/4*(b*c*Sqrt[1 - c^2*x^4])/x^2 - (a + b*ArcSin[c*x^2])/(4*x^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{4x^4}+\frac{1}{4}b\int\frac{2c}{x^3\sqrt{1-c^2x^4}}\,dx\\ &= -\frac{a+b\arcsin\left(cx^2\right)}{4x^4}+\frac{1}{2}(bc)\int\frac{1}{x^3\sqrt{1-c^2x^4}}\,dx\\ &= -\frac{bc\sqrt{1-c^2x^4}}{4x^2}-\frac{a+b\arcsin\left(cx^2\right)}{4x^4}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.12

$$\int\frac{a+b\arcsin\left(cx^2\right)}{x^5}\,dx=-\frac{a}{4x^4}-\frac{bc\sqrt{1-c^2x^4}}{4x^2}-\frac{b\arcsin\left(cx^2\right)}{4x^4}$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^5,x]
[Out] -1/4*a/x^4 - (b*c*Sqrt[1 - c^2*x^4])/(4*x^2) - (b*ArcSin[c*x^2])/(4*x^4)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.32

method	result	size
default	$-\frac{a}{4x^4}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{4x^4}+\frac{c\left(c\,x^2-1\right)\left(c\,x^2+1\right)}{4x^2\sqrt{-c^2x^4+1}}\right)$	54
parts	$-\frac{a}{4x^4}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{4x^4}+\frac{c\left(c\,x^2-1\right)\left(c\,x^2+1\right)}{4x^2\sqrt{-c^2x^4+1}}\right)$	54

```
[In] int((a+b*arcsin(c*x^2))/x^5,x,method=_RETURNVERBOSE)
[Out] -1/4*a/x^4+b*(-1/4/x^4*arcsin(c*x^2)+1/4*c/x^2*(c*x^2-1)*(c*x^2+1)/(-c^2*x^
4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.02

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = \frac{ax^4 - \sqrt{-c^2x^4+1}bcx^2 - b\arcsin(cx^2) - a}{4\,x^4}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="fricas")
[Out] 1/4*(a*x^4 - sqrt(-c^2*x^4 + 1)*b*c*x^2 - b*arcsin(c*x^2) - a)/x^4
```

Sympy [A] (verification not implemented)

Time = 0.98 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.71

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = -\frac{a}{4x^4} + \frac{bc\left(\begin{cases} -\frac{i\sqrt{c^2x^4-1}}{2x^2} & \text{for } |c^2x^4| > 1 \\ -\frac{\sqrt{-c^2x^4+1}}{2x^2} & \text{otherwise} \end{cases}\right)}{2} - \frac{b\,\text{asin}(cx^2)}{4x^4}$$

```
[In] integrate((a+b*asin(c*x**2))/x**5,x)
[Out] -a/(4*x**4) + b*c*Piecewise((-I*sqrt(c**2*x**4 - 1)/(2*x**2), Abs(c**2*x**4
) > 1), (-sqrt(-c**2*x**4 + 1)/(2*x**2), True))/2 - b*asin(c*x**2)/(4*x**4)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = -\frac{1}{4}b\left(\frac{\sqrt{-c^2x^4+1}c}{x^2} + \frac{\arcsin(cx^2)}{x^4}\right) - \frac{a}{4\,x^4}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="maxima")
[Out] -1/4*b*(sqrt(-c^2*x^4 + 1)*c/x^2 + arcsin(c*x^2)/x^4) - 1/4*a/x^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 176 vs. 2(35) = 70.

Time = 0.29 (sec) , antiderivative size = 176, normalized size of antiderivative = 4.29

$$\int \frac{a + b \arcsin(cx^2)}{x^5} \, dx = -\frac{\frac{bc^5x^4 \arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^2} + \frac{ac^5x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2} - \frac{2\,bc^4x^2}{\sqrt{-c^2x^4+1}+1} + 2\,bc^3 \arcsin(cx^2) + 2\,ac^3 + \frac{2\,bc^2\left(\sqrt{-c^2x^4+1}+1\right)}{x^2} + \frac{bc\left(\sqrt{-c^2x^4}\right.}{}}{16\,c}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="giac")
```

```
[Out] -1/16*(b*c^5*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + a*c^5*x^4/(sqrt
(-c^2*x^4 + 1) + 1)^2 - 2*b*c^4*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 2*b*c^3*arcs
in(c*x^2) + 2*a*c^3 + 2*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)/x^2 + b*c*(sqrt(-c^2
*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + a*c*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^2)}{x^5} \, dx = \int \frac{a + b \operatorname{asin}(c\,x^2)}{x^5} \, dx$$

```
[In] int((a + b*asin(c*x^2))/x^5,x)
```

```
[Out] int((a + b*asin(c*x^2))/x^5, x)
```

3.348 $\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 64

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{a+b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[Out] 1/6*(-a-b*arcsin(c*x^2))/x^6-1/12*b*c^3*arctanh((-c^2*x^4+1)^(1/2))-1/12*b*
c*(-c^2*x^4+1)^(1/2)/x^4
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4926, 12, 272, 44, 65, 214}

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{a+b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\text{arctanh}\left(\sqrt{1-c^2x^4}\right) - \frac{bc\sqrt{1-c^2x^4}}{12x^4}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^7,x]
```

```
[Out] -1/12*(b*c*Sqrt[1 - c^2*x^4])/x^4 - (a + b*ArcSin[c*x^2])/(6*x^6) - (b*c^3*
ArcTanh[Sqrt[1 - c^2*x^4]])/12
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
```

```
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] && !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{6x^6}+\frac{1}{6}b\int\frac{2c}{x^5\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{6x^6}+\frac{1}{3}(bc)\int\frac{1}{x^5\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{6x^6}+\frac{1}{12}(bc)\text{Subst}\left(\int\frac{1}{x^2\sqrt{1-c^2x}}\,dx,x,x^4\right)\\
&= -\frac{bc\sqrt{1-c^2x^4}}{12x^4}-\frac{a+b\arcsin\left(cx^2\right)}{6x^6}+\frac{1}{24}\left(bc^3\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^4\right)
\end{aligned}$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{a+b\arcsin(cx^2)}{6x^6} - \frac{1}{12}(bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^4}\right)$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{a+b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.08

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{a}{6x^6} - \frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^7,x]
[Out] -1/6*a/x^6 - (b*c*Sqrt[1 - c^2*x^4])/(12*x^4) - (b*ArcSin[c*x^2])/(6*x^6) -
 (b*c^3*ArcTanh[Sqrt[1 - c^2*x^4]])/12
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.95

method	result	size
default	$-\frac{a}{6x^6}+b\left(-\frac{\arcsin(cx^2)}{6x^6}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{4x^4}-\frac{c^2\,\text{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{4}\right)}{3}\right)$	61
parts	$-\frac{a}{6x^6}+b\left(-\frac{\arcsin(cx^2)}{6x^6}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{4x^4}-\frac{c^2\,\text{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{4}\right)}{3}\right)$	61

```
[In] int((a+b*arcsin(c*x^2))/x^7,x,method=_RETURNVERBOSE)
[Out] -1/6*a/x^6+b*(-1/6/x^6*arcsin(c*x^2)+1/3*c*(-1/4/x^4*(-c^2*x^4+1)^(1/2)-1/4
*c^2*arctanh(1/(-c^2*x^4+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.31

$$\int \frac{a + b\arcsin(cx^2)}{x^7}\,dx = -\frac{bc^3x^6\log\left(\sqrt{-c^2x^4+1}+1\right) - bc^3x^6\log\left(\sqrt{-c^2x^4+1}-1\right) + 2\sqrt{-c^2x^4+1}bcx^2 + 4\,b\arcsin(cx^2) + 4\,a}{24\,x^6}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="fricas")
[Out] -1/24*(b*c^3*x^6*log(sqrt(-c^2*x^4 + 1) + 1) - b*c^3*x^6*log(sqrt(-c^2*x^4
+ 1) - 1) + 2*sqrt(-c^2*x^4 + 1)*b*c*x^2 + 4*b*arcsin(c*x^2) + 4*a)/x^6
```

Sympy [A] (verification not implemented)

Time = 2.10 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.97

$$\int \frac{a + b\arcsin(cx^2)}{x^7}\,dx = -\frac{a}{6x^6} + \frac{bc\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{4} + \frac{c}{4x^2\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{1}{4cx^6\sqrt{-1+\frac{1}{c^2x^4}}} & \text{for } \frac{1}{|c^2x^4|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx^2}\right)}{4} - \frac{ic\sqrt{1-\frac{1}{c^2x^4}}}{4x^2} & \text{otherwise} \end{cases}\right)}{3} - \frac{b\operatorname{asin}(cx^2)}{6x^6}$$

```
[In] integrate((a+b*asin(c*x**2))/x**7,x)
[Out] -a/(6*x**6) + b*c*Piecewise((-c**2*acosh(1/(c*x**2))/4 + c/(4*x**2*sqrt(-1
+ 1/(c**2*x**4))) - 1/(4*c*x**6*sqrt(-1 + 1/(c**2*x**4))), 1/Abs(c**2*x**4)
 > 1), (I*c**2*asin(1/(c*x**2))/4 - I*c*sqrt(1 - 1/(c**2*x**4))/(4*x**2), T
rue))/3 - b*asin(c*x**2)/(6*x**6)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.27

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{1}{24}\left(\left(c^2\log\left(\sqrt{-c^2x^4+1}+1\right)-c^2\log\left(\sqrt{-c^2x^4+1}-1\right)+\frac{2\sqrt{-c^2x^4+1}}{x^4}\right)c+\frac{4\arcsin(cx^2)}{x^6}\right)b - \frac{a}{6x^6}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="maxima")
```

```
[Out] -1/24*((c^2*log(sqrt(-c^2*x^4 + 1) + 1) - c^2*log(sqrt(-c^2*x^4 + 1) - 1) +
 2*sqrt(-c^2*x^4 + 1)/x^4)*c + 4*arcsin(c*x^2)/x^6)*b - 1/6*a/x^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 301 vs. 2(54) = 108.

Time = 0.48 (sec) , antiderivative size = 301, normalized size of antiderivative = 4.70

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{\frac{bc^7x^6\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^3}+\frac{ac^7x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3}-\frac{bc^6x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{3\,bc^5x^2\arcsin(cx^2)}{\sqrt{-c^2x^4+1}+1}+\frac{3\,ac^5x^2}{\sqrt{-c^2x^4+1}+1}-4\,bc^4\log\left(x^2|c|\right)+4\,bc^4}{}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="giac")
```

```
[Out] -1/48*(b*c^7*x^6*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^3 + a*c^7*x^6/(sqrt
(-c^2*x^4 + 1) + 1)^3 - b*c^6*x^4/(sqrt(-c^2*x^4 + 1) + 1)^2 + 3*b*c^5*x^2*
arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1) + 3*a*c^5*x^2/(sqrt(-c^2*x^4 + 1) +
1) - 4*b*c^4*log(x^2*abs(c)) + 4*b*c^4*log(sqrt(-c^2*x^4 + 1) + 1) + 3*b*c^
3*(sqrt(-c^2*x^4 + 1) + 1)*arcsin(c*x^2)/x^2 + 3*a*c^3*(sqrt(-c^2*x^4 + 1)
+ 1)/x^2 + b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4 + b*c*(sqrt(-c^2*x^4 + 1) +
 1)^3*arcsin(c*x^2)/x^6 + a*c*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^7}\,dx$$

```
[In] int((a + b*asin(c*x^2))/x^7,x)
[Out] int((a + b*asin(c*x^2))/x^7, x)
```

3.349 $\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 66

$$\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx=-\frac{bc\sqrt{1-c^2x^4}}{24x^6}-\frac{bc^3\sqrt{1-c^2x^4}}{12x^2}-\frac{a+b\arcsin(cx^2)}{8x^8}$$

```
[Out] 1/8*(-a-b*arcsin(c*x^2))/x^8-1/24*b*c*(-c^2*x^4+1)^(1/2)/x^6-1/12*b*c^3*(-c
^2*x^4+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 277, 270}

$$\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx=-\frac{a+b\arcsin(cx^2)}{8x^8}-\frac{bc\sqrt{1-c^2x^4}}{24x^6}-\frac{bc^3\sqrt{1-c^2x^4}}{12x^2}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^9,x]
```

```
[Out] -1/24*(b*c*Sqrt[1 - c^2*x^4])/x^6 - (b*c^3*Sqrt[1 - c^2*x^4])/(12*x^2) - (a
 + b*ArcSin[c*x^2])/(8*x^8)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{8x^8}+\frac{1}{8}b\int\frac{2c}{x^7\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{8x^8}+\frac{1}{4}(bc)\int\frac{1}{x^7\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{bc\sqrt{1-c^2x^4}}{24x^6}-\frac{a+b\arcsin\left(cx^2\right)}{8x^8}+\frac{1}{6}\left(bc^3\right)\int\frac{1}{x^3\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{bc\sqrt{1-c^2x^4}}{24x^6}-\frac{bc^3\sqrt{1-c^2x^4}}{12x^2}-\frac{a+b\arcsin\left(cx^2\right)}{8x^8}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.91

$$\int\frac{a+b\arcsin\left(cx^2\right)}{x^9}\,dx=-\frac{a}{8x^8}+\frac{1}{2}b\left(-\frac{c\sqrt{1-c^2x^4}\left(1+2c^2x^4\right)}{12x^6}-\frac{\arcsin\left(cx^2\right)}{4x^8}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^9,x]
```

```
[Out] -1/8*a/x^8 + (b*(-1/12*(c*Sqrt[1 - c^2*x^4]*(1 + 2*c^2*x^4))/x^6 - ArcSin[c
*x^2]/(4*x^8)))/2
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.97

method	result	size
default	$-\frac{a}{8x^{8}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{8x^{8}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(2c^{2}x^{4}+1\right)}{24x^{6}\sqrt{-c^{2}x^{4}+1}}\right)$	64
parts	$-\frac{a}{8x^{8}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{8x^{8}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(2c^{2}x^{4}+1\right)}{24x^{6}\sqrt{-c^{2}x^{4}+1}}\right)$	64

```
[In] int((a+b*arcsin(c*x^2))/x^9,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a/x^8+b*(-1/8/x^8*arcsin(c*x^2)+1/24*c*(c*x^2-1)*(c*x^2+1)*(2*c^2*x^4+
1)/x^6/(-c^2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x^{9}}\,dx=\frac{3\,ax^{8}-3\,b\arcsin\left(cx^{2}\right)-\left(2\,bc^{3}x^{6}+bcx^{2}\right)\sqrt{-c^{2}x^{4}+1}-3\,a}{24\,x^{8}}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="fricas")
```

```
[Out] 1/24*(3*a*x^8 - 3*b*arcsin(c*x^2) - (2*b*c^3*x^6 + b*c*x^2)*sqrt(-c^2*x^4 +
 1) - 3*a)/x^8
```

Sympy [A] (verification not implemented)

Time = 1.91 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.70

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x^{9}}\,dx=-\frac{a}{8x^{8}}+\frac{bc\left(\begin{cases}-\frac{ic^{2}\sqrt{c^{2}x^{4}-1}}{3x^{2}}-\frac{i\sqrt{c^{2}x^{4}-1}}{6x^{6}} & \text{for}\ \left|c^{2}x^{4}\right|>1\\-\frac{c^{2}\sqrt{-c^{2}x^{4}+1}}{3x^{2}}-\frac{\sqrt{-c^{2}x^{4}+1}}{6x^{6}} & \text{otherwise}\end{cases}\right)}{4}-\frac{b\,\mathrm{asin}\left(cx^{2}\right)}{8x^{8}}$$

```
[In] integrate((a+b*asin(c*x**2))/x**9,x)
```

```
[Out] -a/(8*x**8) + b*c*Piecewise((-I*c**2*sqrt(c**2*x**4 - 1)/(3*x**2) - I*sqrt(
c**2*x**4 - 1)/(6*x**6), Abs(c**2*x**4) > 1), (-c**2*sqrt(-c**2*x**4 + 1)/(
3*x**2) - sqrt(-c**2*x**4 + 1)/(6*x**6), True))/4 - b*asin(c*x**2)/(8*x**8)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.92

$$\int \frac{a + b\arcsin\left(cx^2\right)}{x^9}\,dx = -\frac{1}{24}\left(c\left(\frac{3\sqrt{-c^2x^4+1}c^2}{x^2} + \frac{\left(-c^2x^4+1\right)^{\frac{3}{2}}}{x^6}\right) + \frac{3\arcsin\left(cx^2\right)}{x^8}\right)b - \frac{a}{8x^8}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="maxima")
```

```
[Out] -1/24*(c*(3*sqrt(-c^2*x^4 + 1)*c^2/x^2 + (-c^2*x^4 + 1)^(3/2)/x^6) + 3*arcs
in(c*x^2)/x^8)*b - 1/8*a/x^8
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 342 vs. $2(56) = 112$.

Time = 0.29 (sec) , antiderivative size = 342, normalized size of antiderivative = 5.18

$$\int \frac{a + b\arcsin\left(cx^2\right)}{x^9}\,dx = -\frac{\frac{3bc^9x^8\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^4} + \frac{3ac^9x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4} - \frac{2bc^8x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3} + \frac{12bc^7x^4\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^2} + \frac{12ac^7x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2} - \frac{18bc^6x^2}{\sqrt{-c^2x^4+1}+1} + 18}{}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="giac")
```

```
[Out] -1/384*(3*b*c^9*x^8*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^4 + 3*a*c^9*x^8/
(sqrt(-c^2*x^4 + 1) + 1)^4 - 2*b*c^8*x^6/(sqrt(-c^2*x^4 + 1) + 1)^3 + 12*b*
c^7*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + 12*a*c^7*x^4/(sqrt(-c^2*
x^4 + 1) + 1)^2 - 18*b*c^6*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 18*b*c^5*arcsin(c
*x^2) + 18*a*c^5 + 18*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)/x^2 + 12*b*c^3*(sqrt(-
c^2*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + 12*a*c^3*(sqrt(-c^2*x^4 + 1) + 1)^2
/x^4 + 2*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6 + 3*b*c*(sqrt(-c^2*x^4 + 1) +
 1)^4*arcsin(c*x^2)/x^8 + 3*a*c*(sqrt(-c^2*x^4 + 1) + 1)^4/x^8)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^9}\,dx$$

```
[In] int((a + b*asin(c*x^2))/x^9,x)
[Out] int((a + b*asin(c*x^2))/x^9, x)
```

3.350 $\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 89

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{40x^8}-\frac{3bc^3\sqrt{1-c^2x^4}}{80x^4}-\frac{a+b\arcsin(cx^2)}{10x^{10}}-\frac{3}{80}bc^5\operatorname{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

```
[Out] 1/10*(-a-b*arcsin(c*x^2))/x^10-3/80*b*c^5*arctanh((-c^2*x^4+1)^(1/2))-1/40*
b*c*(-c^2*x^4+1)^(1/2)/x^8-3/80*b*c^3*(-c^2*x^4+1)^(1/2)/x^4
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4926, 12, 272, 44, 65, 214}

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{a+b\arcsin(cx^2)}{10x^{10}}-\frac{3}{80}bc^5\operatorname{arctanh}\left(\sqrt{1-c^2x^4}\right)-\frac{bc\sqrt{1-c^2x^4}}{40x^8}-\frac{3bc^3\sqrt{1-c^2x^4}}{80x^4}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^11,x]
```

```
[Out] -1/40*(b*c*Sqrt[1 - c^2*x^4])/x^8 - (3*b*c^3*Sqrt[1 - c^2*x^4])/(80*x^4) -
(a + b*ArcSin[c*x^2])/(10*x^10) - (3*b*c^5*ArcTanh[Sqrt[1 - c^2*x^4]])/80
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}+\frac{1}{10}b\int\frac{2c}{x^9\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}+\frac{1}{5}(bc)\int\frac{1}{x^9\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}+\frac{1}{20}(bc)\text{Subst}\left(\int\frac{1}{x^3\sqrt{1-c^2x}}\,dx,x,x^4\right)
\end{aligned}$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{40x^8} - \frac{a+b\arcsin(cx^2)}{10x^{10}} + \frac{1}{80}(3bc^3)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}\,dx, x, x^4\right)$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{40x^8} - \frac{3bc^3\sqrt{1-c^2x^4}}{80x^4} - \frac{a+b\arcsin(cx^2)}{10x^{10}} + \frac{1}{160}(3bc^5)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^4\right)$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{40x^8} - \frac{3bc^3\sqrt{1-c^2x^4}}{80x^4} - \frac{a+b\arcsin(cx^2)}{10x^{10}} - \frac{1}{80}(3bc^3)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^4}\right)$$

$$= -\frac{bc\sqrt{1-c^2x^4}}{40x^8} - \frac{3bc^3\sqrt{1-c^2x^4}}{80x^4} - \frac{a+b\arcsin(cx^2)}{10x^{10}} - \frac{3}{80}bc^5\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 0.02 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.71

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{a}{10x^{10}} - \frac{b\arcsin(cx^2)}{10x^{10}} - \frac{1}{10}bc^5\sqrt{1-c^2x^4}\,\text{Hypergeometric2F1}\left(\frac{1}{2}, 3, \frac{3}{2}, 1-c^2x^4\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^11,x]
[Out] -1/10*a/x^10 - (b*ArcSin[c*x^2])/(10*x^10) - (b*c^5*Sqrt[1 - c^2*x^4]*Hyper
geometric2F1[1/2, 3, 3/2, 1 - c^2*x^4])/10
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.94

method	result	size
default	$-\frac{a}{10x^{10}}+b\left(-\frac{\arcsin(c x^2)}{10x^{10}}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{8x^8}+\frac{3c^2\left(-\frac{\sqrt{-c^2x^4+1}}{2x^4}-\frac{c^2\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)}{8}\right)}{5}\right)$	84
parts	$-\frac{a}{10x^{10}}+b\left(-\frac{\arcsin(c x^2)}{10x^{10}}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{8x^8}+\frac{3c^2\left(-\frac{\sqrt{-c^2x^4+1}}{2x^4}-\frac{c^2\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)}{8}\right)}{5}\right)$	84

```
[In] int((a+b*arcsin(c*x^2))/x^11,x,method=_RETURNVERBOSE)
```

```
[Out] -1/10*a/x^10+b*(-1/10/x^10*arcsin(c*x^2)+1/5*c*(-1/8/x^8*(-c^2*x^4+1)^(1/2)
+3/8*c^2*(-1/2/x^4*(-c^2*x^4+1)^(1/2)-1/2*c^2*arctanh(1/(-c^2*x^4+1)^(1/2))
)))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.09

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{3\,bc^5x^{10}\log\left(\sqrt{-c^2x^4+1}+1\right)-3\,bc^5x^{10}\log\left(\sqrt{-c^2x^4+1}-1\right)+16\,b\arcsin\left(cx^2\right)+2\left(3\,bc^3x^6+2\,bcx^2\right)}{160\,x^{10}}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="fricas")
```

```
[Out] -1/160*(3*b*c^5*x^10*log(sqrt(-c^2*x^4 + 1) + 1) - 3*b*c^5*x^10*log(sqrt(-c
^2*x^4 + 1) - 1) + 16*b*arcsin(c*x^2) + 2*(3*b*c^3*x^6 + 2*b*c*x^2)*sqrt(-c
^2*x^4 + 1) + 16*a)/x^10
```

Sympy [A] (verification not implemented)

Time = 5.12 (sec) , antiderivative size = 201, normalized size of antiderivative = 2.26

$$\int \frac{a + b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{a}{10x^{10}} + \frac{bc\left(\begin{cases} -\frac{3c^4\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{16} + \frac{3c^3}{16x^2\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{c}{16x^6\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{1}{8cx^{10}\sqrt{-1+\frac{1}{c^2x^4}}} & \text{for}\ \frac{1}{|c^2x^4|} > 1 \\ \frac{3ic^4\operatorname{asin}\left(\frac{1}{cx^2}\right)}{16} - \frac{3ic^3}{16x^2\sqrt{1-\frac{1}{c^2x^4}}} + \frac{ic}{16x^6\sqrt{1-\frac{1}{c^2x^4}}} + \frac{i}{8cx^{10}\sqrt{1-\frac{1}{c^2x^4}}} & \text{otherwise} \end{cases}\right)}{5} - \frac{b\operatorname{asin}(cx^2)}{10x^{10}}$$

```
[In] integrate((a+b*asin(c*x**2))/x**11,x)
```

```
[Out] -a/(10*x**10) + b*c*Piecewise((-3*c**4*acosh(1/(c*x**2))/16 + 3*c**3/(16*x*
*2*sqrt(-1 + 1/(c**2*x**4))) - c/(16*x**6*sqrt(-1 + 1/(c**2*x**4))) - 1/(8*
c*x**10*sqrt(-1 + 1/(c**2*x**4))), 1/Abs(c**2*x**4) > 1), (3*I*c**4*asin(1/
(c*x**2))/16 - 3*I*c**3/(16*x**2*sqrt(1 - 1/(c**2*x**4))) + I*c/(16*x**6*sq
rt(1 - 1/(c**2*x**4))) + I/(8*c*x**10*sqrt(1 - 1/(c**2*x**4))), True))/5 -
b*asin(c*x**2)/(10*x**10)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.40

$$\int \frac{a + b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{1}{160}\left(\left(\left(3\,c^4\log\left(\sqrt{-c^2x^4+1}+1\right) - 3\,c^4\log\left(\sqrt{-c^2x^4+1}-1\right) - \frac{2\left(3\left(-c^2x^4+1\right)^{\frac{3}{2}}c^4 - 5\sqrt{-c^2x^4+\right.}{2\,c^2x^4+\left(c^2x^4-1\right)^2-1} - \frac{a}{10\,x^{10}}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="maxima")
```

```
[Out] -1/160*((3*c^4*log(sqrt(-c^2*x^4 + 1) + 1) - 3*c^4*log(sqrt(-c^2*x^4 + 1) -
 1) - 2*(3*(-c^2*x^4 + 1)^(3/2)*c^4 - 5*sqrt(-c^2*x^4 + 1)*c^4)/(2*c^2*x^4
+ (c^2*x^4 - 1)^2 - 1))*c + 16*arcsin(c*x^2)/x^10)*b - 1/10*a/x^10
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 467 vs. $2(75) = 150$.

Time = 1.00 (sec) , antiderivative size = 467, normalized size of antiderivative = 5.25

$$\int \frac{a + b\arcsin(cx^2)}{x^{11}}\,dx =$$

$$-\frac{\frac{2\,bc^{11}x^{10}\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^5} + \frac{2\,ac^{11}x^{10}}{\left(\sqrt{-c^2x^4+1}+1\right)^5} - \frac{bc^{10}x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4} + \frac{10\,bc^9x^6\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^3} + \frac{10\,ac^9x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3} - \frac{8\,bc^8x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2} + \cdots}{\cdots}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="giac")
```

```
[Out] -1/640*(2*b*c^11*x^10*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^5 + 2*a*c^11*x
^10/(sqrt(-c^2*x^4 + 1) + 1)^5 - b*c^10*x^8/(sqrt(-c^2*x^4 + 1) + 1)^4 + 10
*b*c^9*x^6*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^3 + 10*a*c^9*x^6/(sqrt(-c
^2*x^4 + 1) + 1)^3 - 8*b*c^8*x^4/(sqrt(-c^2*x^4 + 1) + 1)^2 + 20*b*c^7*x^2*
arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1) + 20*a*c^7*x^2/(sqrt(-c^2*x^4 + 1) +
 1) - 24*b*c^6*log(x^2*abs(c)) + 24*b*c^6*log(sqrt(-c^2*x^4 + 1) + 1) + 20*
b*c^5*(sqrt(-c^2*x^4 + 1) + 1)*arcsin(c*x^2)/x^2 + 20*a*c^5*(sqrt(-c^2*x^4
+ 1) + 1)/x^2 + 8*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4 + 10*b*c^3*(sqrt(-c^
2*x^4 + 1) + 1)^3*arcsin(c*x^2)/x^6 + 10*a*c^3*(sqrt(-c^2*x^4 + 1) + 1)^3/x
^6 + b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^4/x^8 + 2*b*c*(sqrt(-c^2*x^4 + 1) + 1)^
5*arcsin(c*x^2)/x^10 + 2*a*c*(sqrt(-c^2*x^4 + 1) + 1)^5/x^10)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx^2)}{x^{11}}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x^2)}{x^{11}}\,dx$$

```
[In] int((a + b*asin(c*x^2))/x^11,x)
```

```
[Out] int((a + b*asin(c*x^2))/x^11, x)
```

3.351 $\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 91

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{60x^{10}} - \frac{bc^3\sqrt{1-c^2x^4}}{45x^6} - \frac{2bc^5\sqrt{1-c^2x^4}}{45x^2} - \frac{a+b\arcsin(cx^2)}{12x^{12}}$$

```
[Out] 1/12*(-a-b*arcsin(c*x^2))/x^12-1/60*b*c*(-c^2*x^4+1)^(1/2)/x^10-1/45*b*c^3*
(-c^2*x^4+1)^(1/2)/x^6-2/45*b*c^5*(-c^2*x^4+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 277, 270}

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx = -\frac{a+b\arcsin(cx^2)}{12x^{12}} - \frac{bc\sqrt{1-c^2x^4}}{60x^{10}} - \frac{2bc^5\sqrt{1-c^2x^4}}{45x^2} - \frac{bc^3\sqrt{1-c^2x^4}}{45x^6}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^13,x]
```

```
[Out] -1/60*(b*c*Sqrt[1 - c^2*x^4])/x^10 - (b*c^3*Sqrt[1 - c^2*x^4])/(45*x^6) - (
2*b*c^5*Sqrt[1 - c^2*x^4])/(45*x^2) - (a + b*ArcSin[c*x^2])/(12*x^12)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}+\frac{1}{12}b\int\frac{2c}{x^{11}\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}+\frac{1}{6}(bc)\int\frac{1}{x^{11}\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{bc\sqrt{1-c^2x^4}}{60x^{10}}-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}+\frac{1}{15}\left(2bc^3\right)\int\frac{1}{x^7\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{bc\sqrt{1-c^2x^4}}{60x^{10}}-\frac{bc^3\sqrt{1-c^2x^4}}{45x^6}-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}+\frac{1}{45}\left(4bc^5\right)\int\frac{1}{x^3\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{bc\sqrt{1-c^2x^4}}{60x^{10}}-\frac{bc^3\sqrt{1-c^2x^4}}{45x^6}-\frac{2bc^5\sqrt{1-c^2x^4}}{45x^2}-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.75

$$\int\frac{a+b\arcsin\left(cx^2\right)}{x^{13}}\,dx=-\frac{a}{12x^{12}}+\frac{1}{2}b\left(-\frac{c\sqrt{1-c^2x^4}\left(3+4c^2x^4+8c^4x^8\right)}{90x^{10}}-\frac{\arcsin\left(cx^2\right)}{6x^{12}}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^13,x]
[Out] -1/12*a/x^12 + (b*(-1/90*(c*Sqrt[1 - c^2*x^4]*(3 + 4*c^2*x^4 + 8*c^4*x^8))/
x^10 - ArcSin[c*x^2]/(6*x^12)))/2
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.79

method	result	size
default	$-\frac{a}{12x^{12}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{12x^{12}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(8c^{4}x^{8}+4c^{2}x^{4}+3\right)}{180x^{10}\sqrt{-c^{2}x^{4}+1}}\right)$	72
parts	$-\frac{a}{12x^{12}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{12x^{12}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(8c^{4}x^{8}+4c^{2}x^{4}+3\right)}{180x^{10}\sqrt{-c^{2}x^{4}+1}}\right)$	72

```
[In] int((a+b*arcsin(c*x^2))/x^13,x,method=_RETURNVERBOSE)
[Out] -1/12*a/x^12+b*(-1/12/x^12*arcsin(c*x^2)+1/180*c*(c*x^2-1)*(c*x^2+1)*(8*c^4
*x^8+4*c^2*x^4+3)/x^10/(-c^2*x^4+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.70

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x^{13}}\,dx = \frac{15\,ax^{12}-15\,b\arcsin\left(cx^{2}\right)-\left(8\,bc^{5}x^{10}+4\,bc^{3}x^{6}+3\,bcx^{2}\right)\sqrt{-c^{2}x^{4}+1}-15\,a}{180\,x^{12}}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="fricas")
[Out] 1/180*(15*a*x^12 - 15*b*arcsin(c*x^2) - (8*b*c^5*x^10 + 4*b*c^3*x^6 + 3*b*c
*x^2)*sqrt(-c^2*x^4 + 1) - 15*a)/x^12
```

Sympy [A] (verification not implemented)

Time = 5.26 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.87

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x^{13}}\,dx = -\frac{a}{12x^{12}}+\frac{bc\left(\begin{cases}-\frac{4c^{5}\sqrt{-1+\frac{1}{c^{2}x^{4}}}}{15}-\frac{2c^{3}\sqrt{-1+\frac{1}{c^{2}x^{4}}}}{15x^{4}}-\frac{c\sqrt{-1+\frac{1}{c^{2}x^{4}}}}{10x^{8}} & \text{for}\ \frac{1}{\left|c^{2}x^{4}\right|}>1\\ -\frac{4ic^{5}\sqrt{1-\frac{1}{c^{2}x^{4}}}}{15}-\frac{2ic^{3}\sqrt{1-\frac{1}{c^{2}x^{4}}}}{15x^{4}}-\frac{ic\sqrt{1-\frac{1}{c^{2}x^{4}}}}{10x^{8}} & \text{otherwise}\end{cases}\right)}{6}-\frac{b\operatorname{asin}\left(cx^{2}\right)}{12x^{12}}$$

```
[In] integrate((a+b*asin(c*x**2))/x**13,x)
```

```
[Out] -a/(12*x**12) + b*c*Piecewise((-4*c**5*sqrt(-1 + 1/(c**2*x**4))/15 - 2*c**3
*sqrt(-1 + 1/(c**2*x**4))/(15*x**4) - c*sqrt(-1 + 1/(c**2*x**4))/(10*x**8),
 1/Abs(c**2*x**4) > 1), (-4*I*c**5*sqrt(1 - 1/(c**2*x**4))/15 - 2*I*c**3*sq
rt(1 - 1/(c**2*x**4))/(15*x**4) - I*c*sqrt(1 - 1/(c**2*x**4))/(10*x**8), Tr
ue))/6 - b*asin(c*x**2)/(12*x**12)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^{13}}\,dx = -\frac{1}{180}\left(\left(\frac{15\sqrt{-c^2x^4+1}c^4}{x^2}+\frac{10\left(-c^2x^4+1\right)^{\frac{3}{2}}c^2}{x^6}+\frac{3\left(-c^2x^4+1\right)^{\frac{5}{2}}}{x^{10}}\right)c+\frac{15\arcsin\left(cx^2\right)}{x^{12}}\right)b - \frac{a}{12\,x^{12}}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="maxima")
```

```
[Out] -1/180*((15*sqrt(-c^2*x^4 + 1)*c^4/x^2 + 10*(-c^2*x^4 + 1)^(3/2)*c^2/x^6 +
3*(-c^2*x^4 + 1)^(5/2)/x^10)*c + 15*arcsin(c*x^2)/x^12)*b - 1/12*a/x^12
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 504 vs. $2(77) = 154$.

Time = 0.31 (sec) , antiderivative size = 504, normalized size of antiderivative = 5.54

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^{13}}\,dx = -\frac{\frac{15\,bc^{13}x^{12}\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^6}+\frac{15\,ac^{13}x^{12}}{\left(\sqrt{-c^2x^4+1}+1\right)^6}-\frac{6\,bc^{12}x^{10}}{\left(\sqrt{-c^2x^4+1}+1\right)^5}+\frac{90\,bc^{11}x^8\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^4}+\frac{90\,ac^{11}x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4}-\frac{50\,bc^{10}x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3}}{}$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="giac")
```

```
[Out] -1/11520*(15*b*c^13*x^12*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^6 + 15*a*c^
13*x^12/(sqrt(-c^2*x^4 + 1) + 1)^6 - 6*b*c^12*x^10/(sqrt(-c^2*x^4 + 1) + 1)
^5 + 90*b*c^11*x^8*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^4 + 90*a*c^11*x^8
/(sqrt(-c^2*x^4 + 1) + 1)^4 - 50*b*c^10*x^6/(sqrt(-c^2*x^4 + 1) + 1)^3 + 22
5*b*c^9*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + 225*a*c^9*x^4/(sqrt(
-c^2*x^4 + 1) + 1)^2 - 300*b*c^8*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 300*b*c^7*a
rcsin(c*x^2) + 300*a*c^7 + 300*b*c^6*(sqrt(-c^2*x^4 + 1) + 1)/x^2 + 225*b*c
```

```
^5*(sqrt(-c^2*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + 225*a*c^5*(sqrt(-c^2*x^4
+ 1) + 1)^2/x^4 + 50*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6 + 90*b*c^3*(sqrt(
-c^2*x^4 + 1) + 1)^4*arcsin(c*x^2)/x^8 + 90*a*c^3*(sqrt(-c^2*x^4 + 1) + 1)^
4/x^8 + 6*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^5/x^10 + 15*b*c*(sqrt(-c^2*x^4 + 1
) + 1)^6*arcsin(c*x^2)/x^12 + 15*a*c*(sqrt(-c^2*x^4 + 1) + 1)^6/x^12)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^2)}{x^{13}} \, dx = \int \frac{a + b \operatorname{asin}(c\,x^2)}{x^{13}} \, dx$$

```
[In] int((a + b*asin(c*x^2))/x^13,x)
[Out] int((a + b*asin(c*x^2))/x^13, x)
```

3.352 $\int x^6(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 86

$$\int x^6(a+b\arcsin(cx^2))\,dx=\frac{10bx\sqrt{1-c^2x^4}}{147c^3}+\frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{1}{7}x^7(a+b\arcsin(cx^2))-\frac{10b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{147c^{7/2}}$$

```
[Out] 1/7*x^7*(a+b*arcsin(c*x^2))-10/147*b*EllipticF(x*c^(1/2),I)/c^(7/2)+10/147*
b*x*(-c^2*x^4+1)^(1/2)/c^3+2/49*b*x^5*(-c^2*x^4+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 327, 227}

$$\int x^6(a+b\arcsin(cx^2))\,dx=\frac{1}{7}x^7(a+b\arcsin(cx^2))-\frac{10b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{147c^{7/2}}+\frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{10bx\sqrt{1-c^2x^4}}{147c^3}$$

```
[In] Int[x^6*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (10*b*x*Sqrt[1 - c^2*x^4])/(147*c^3) + (2*b*x^5*Sqrt[1 - c^2*x^4])/(49*c) +
 (x^7*(a + b*ArcSin[c*x^2]))/7 - (10*b*EllipticF[ArcSin[Sqrt[c]*x], -1])/(1
47*c^(7/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{7}b\int\frac{2cx^8}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{7}(2bc)\int\frac{x^8}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)-\frac{(10b)\int\frac{x^4}{\sqrt{1-c^2x^4}}\,dx}{49c}\\
&= \frac{10bx\sqrt{1-c^2x^4}}{147c^3}+\frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)-\frac{(10b)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx}{147c^3}\\
&= \frac{10bx\sqrt{1-c^2x^4}}{147c^3}+\frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)\\
&\quad-\frac{10b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{147c^{7/2}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.95

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{147}\left(21ax^7+\frac{2bx\sqrt{1-c^2x^4}(5+3c^2x^4)}{c^3}+21bx^7\arcsin\left(cx^2\right)-\frac{10ib\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{(-c)^{7/2}}\right)$$

[In] Integrate[x^6*(a + b*ArcSin[c*x^2]),x]

[Out] (21*a*x^7 + (2*b*x*Sqrt[1 - c^2*x^4]*(5 + 3*c^2*x^4))/c^3 + 21*b*x^7*ArcSin[c*x^2] - ((10*I)*b*EllipticF[I*ArcSinh[Sqrt[-c]*x], -1])/(-c)^(7/2))/147

Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.26

method	result	size
default	$\frac{x^7a}{7}+b\left(\frac{x^7\arcsin\left(cx^2\right)}{7}-\frac{2c\left(-\frac{x^5\sqrt{-c^2x^4+1}}{7c^2}-\frac{5x\sqrt{-c^2x^4+1}}{21c^4}+\frac{5\sqrt{-cx^2+1}\,\sqrt{cx^2+1}\,\text{EllipticF}\left(x\sqrt{c},i\right)}{21c^{\frac{9}{2}}\sqrt{-c^2x^4+1}}\right)}{7}\right)$	108
parts	$\frac{x^7a}{7}+b\left(\frac{x^7\arcsin\left(cx^2\right)}{7}-\frac{2c\left(-\frac{x^5\sqrt{-c^2x^4+1}}{7c^2}-\frac{5x\sqrt{-c^2x^4+1}}{21c^4}+\frac{5\sqrt{-cx^2+1}\,\sqrt{cx^2+1}\,\text{EllipticF}\left(x\sqrt{c},i\right)}{21c^{\frac{9}{2}}\sqrt{-c^2x^4+1}}\right)}{7}\right)$	108

[In] int(x^6*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)

[Out] 1/7*x^7*a+b*(1/7*x^7*arcsin(c*x^2)-2/7*c*(-1/7/c^2*x^5*(-c^2*x^4+1)^(1/2)-5/21/c^4*x*(-c^2*x^4+1)^(1/2)+5/21/c^(9/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*c^(1/2),I)))

Fricas [A] (verification not implemented)

none

Time = 0.10 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{21\,bc^3x^7\arcsin\left(cx^2\right)+21\,ac^3x^7+2\,\left(3\,bc^2x^5+5\,bx\right)\sqrt{-c^2x^4+1}}{147\,c^3}$$

```
[In] integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
[Out] 1/147*(21*b*c^3*x^7*arcsin(c*x^2) + 21*a*c^3*x^7 + 2*(3*b*c^2*x^5 + 5*b*x)*
sqrt(-c^2*x^4 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 1.36 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{ax^7}{7}-\frac{bcx^9\Gamma\left(\frac{9}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{14\Gamma\left(\frac{13}{4}\right)}+\frac{bx^7\operatorname{asin}\left(cx^2\right)}{7}$$

```
[In] integrate(x**6*(a+b*asin(c*x**2)),x)
[Out] a*x**7/7 - b*c*x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(14*gamma(13/4)) + b*x**7*asin(c*x**2)/7
```

Maxima [F]

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \int \left(b\arcsin\left(cx^2\right)+a\right)x^6\,dx$$

```
[In] integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
[Out] 1/7*a*x^7 + 1/7*(x^7*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 14*
c*integrate(1/7*x^8*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 -
 c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b
```

Giac [F]

$$\int x^6 \left(a+b \arcsin \left(c x^2\right)\right) \, dx=\int \left(b \arcsin \left(c x^2\right)+a\right) x^6 \, dx$$

```
[In] integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^2) + a)*x^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^6 \left(a+b \arcsin \left(c x^2\right)\right) \, dx=\int x^6 \, \left(a+b \,\mathrm{asin}\left(c\,x^2\right)\right) \,d x$$

```
[In] int(x^6*(a + b*asin(c*x^2)),x)
[Out] int(x^6*(a + b*asin(c*x^2)), x)
```

3.353 $\int x^4(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 83

$$\int x^4(a+b\arcsin(cx^2))\,dx=\frac{2bx^3\sqrt{1-c^2x^4}}{25c}+\frac{1}{5}x^5(a+b\arcsin(cx^2))-\frac{6bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{25c^{5/2}}+\frac{6b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{25c^{5/2}}$$

```
[Out] 1/5*x^5*(a+b*arcsin(c*x^2))-6/25*b*EllipticE(x*c^(1/2),I)/c^(5/2)+6/25*b*El
lipticF(x*c^(1/2),I)/c^(5/2)+2/25*b*x^3*(-c^2*x^4+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4926, 12, 327, 313, 227, 1213, 435}

$$\int x^4(a+b\arcsin(cx^2))\,dx=\frac{1}{5}x^5(a+b\arcsin(cx^2))+\frac{6b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{25c^{5/2}}-\frac{6bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{25c^{5/2}}+\frac{2bx^3\sqrt{1-c^2x^4}}{25c}$$

```
[In] Int[x^4*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (2*b*x^3*Sqrt[1 - c^2*x^4])/(25*c) + (x^5*(a + b*ArcSin[c*x^2]))/5 - (6*b*E
llipticE[ArcSin[Sqrt[c]*x], -1])/(25*c^(5/2)) + (6*b*EllipticF[ArcSin[Sqrt[
c]*x], -1])/(25*c^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 313

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Dist[-q^(-1), Int[1/Sqrt[a + b*x^4], x], x] + Dist[1/q, Int[(1 + q*x^2)/Sqr
t[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 1213

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (c_.)*(x_)^4], x_Symbol] :> Dist[d/Sq
rt[a], Int[Sqrt[1 + e*(x^2/d)]/Sqrt[1 - e*(x^2/d)], x], x] /; FreeQ[{a, c,
d, e}, x] && NegQ[c/a] && EqQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\text{integral} = \frac{1}{5}x^5\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{5}b\int\frac{2cx^6}{\sqrt{1-c^2x^4}}\,dx$$

$$= \frac{1}{5}x^5\left(a + b\arcsin\left(cx^2\right)\right) - \frac{1}{5}(2bc)\int \frac{x^6}{\sqrt{1-c^2x^4}}\,dx$$

$$= \frac{2bx^3\sqrt{1-c^2x^4}}{25c} + \frac{1}{5}x^5\left(a + b\arcsin\left(cx^2\right)\right) - \frac{(6b)\int \frac{x^2}{\sqrt{1-c^2x^4}}\,dx}{25c}$$

$$= \frac{2bx^3\sqrt{1-c^2x^4}}{25c} + \frac{1}{5}x^5\left(a + b\arcsin\left(cx^2\right)\right) + \frac{(6b)\int \frac{1}{\sqrt{1-c^2x^4}}\,dx}{25c^2} - \frac{(6b)\int \frac{1+cx^2}{\sqrt{1-c^2x^4}}\,dx}{25c^2}$$

$$= \frac{2bx^3\sqrt{1-c^2x^4}}{25c} + \frac{1}{5}x^5\left(a + b\arcsin\left(cx^2\right)\right) + \frac{6b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{25c^{5/2}} - \frac{(6b)\int \frac{\sqrt{1+cx^2}}{\sqrt{1-cx^2}}\,dx}{25c^2}$$

$$= \frac{2bx^3\sqrt{1-c^2x^4}}{25c} + \frac{1}{5}x^5\left(a + b\arcsin\left(cx^2\right)\right) - \frac{6bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{25c^{5/2}} + \frac{6b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{25c^{5/2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.12

$$\int x^4\left(a + b\arcsin\left(cx^2\right)\right)\,dx = \frac{1}{25}\left(5ax^5 + \frac{2bx^3\sqrt{1-c^2x^4}}{c} + 5bx^5\arcsin\left(cx^2\right) + \frac{6ib\left(E\left(i\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right) - \text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)\right)}{(-c)^{5/2}}\right)$$

```
[In] Integrate[x^4*(a + b*ArcSin[c*x^2]),x]
[Out] (5*a*x^5 + (2*b*x^3*Sqrt[1 - c^2*x^4])/c + 5*b*x^5*ArcSin[c*x^2] + ((6*I)*b
*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-c]*x], -
1]))/(-c)^(5/2))/25
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.22

method	result	size
default	$\frac{a\,x^{5}}{5}+b\left(\frac{x^{5}\arcsin\left(c\,x^{2}\right)}{5}-\frac{2c\left(-\frac{x^{3}\sqrt{-c^{2}x^{4}+1}}{5c^{2}}-\frac{3\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\left(\operatorname{EllipticF}\left(x\sqrt{c},i\right)-\operatorname{EllipticE}\left(x\sqrt{c},i\right)\right)}{5c^{\frac{7}{2}}\sqrt{-c^{2}x^{4}+1}}\right)}{5}\right)$	101
parts	$\frac{a\,x^{5}}{5}+b\left(\frac{x^{5}\arcsin\left(c\,x^{2}\right)}{5}-\frac{2c\left(-\frac{x^{3}\sqrt{-c^{2}x^{4}+1}}{5c^{2}}-\frac{3\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\left(\operatorname{EllipticF}\left(x\sqrt{c},i\right)-\operatorname{EllipticE}\left(x\sqrt{c},i\right)\right)}{5c^{\frac{7}{2}}\sqrt{-c^{2}x^{4}+1}}\right)}{5}\right)$	101

```
[In] int(x^4*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*a*x^5+b*(1/5*x^5*arcsin(c*x^2)-2/5*c*(-1/5/c^2*x^3*(-c^2*x^4+1)^(1/2)-3
/5/c^(7/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*(EllipticF(x
*c^(1/2),I)-EllipticE(x*c^(1/2),I))))
```

Fricas [A] (verification not implemented)

none

Time = 0.09 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.71

$$\int x^4\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{5\,bc^3x^6\arcsin\left(cx^2\right)+5\,ac^3x^6+2\,(bc^2x^4+3\,b)\sqrt{-c^2x^4+1}}{25\,c^3x}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*b*c^3*x^6*arcsin(c*x^2) + 5*a*c^3*x^6 + 2*(b*c^2*x^4 + 3*b)*sqrt(-c
^2*x^4 + 1))/(c^3*x)
```

Sympy [A] (verification not implemented)

Time = 1.14 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.70

$$\int x^4\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^5}{5}-\frac{bcx^7\Gamma\left(\frac{7}{4}\right){}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\right|c^2x^4e^{2i\pi}\right)}{10\Gamma\left(\frac{11}{4}\right)}+\frac{bx^5\operatorname{asin}\left(cx^2\right)}{5}$$

```
[In] integrate(x**4*(a+b*asin(c*x**2)),x)
```

```
[Out] a*x**5/5 - b*c*x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(10*gamma(11/4)) + b*x**5*asin(c*x**2)/5
```

Maxima [F]

$$\int x^4(a+b\arcsin(cx^2))\,dx=\int(b\arcsin(cx^2)+a)x^4\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
[Out] 1/5*a*x^5 + 1/5*(x^5*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 10*
c*integrate(1/5*x^6*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 -
 c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b
```

Giac [F]

$$\int x^4(a+b\arcsin(cx^2))\,dx=\int(b\arcsin(cx^2)+a)x^4\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^2) + a)*x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^4(a+b\arcsin(cx^2))\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x^2))\,dx$$

```
[In] int(x^4*(a + b*asin(c*x^2)),x)
[Out] int(x^4*(a + b*asin(c*x^2)), x)
```

3.354 $\int x^2(a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 61

$$\int x^2(a+b\arcsin(cx^2))\,dx=\frac{2bx\sqrt{1-c^2x^4}}{9c}+\frac{1}{3}x^3(a+b\arcsin(cx^2))-\frac{2b\,\text{EllipticF}(\arcsin(\sqrt{c}x),-1)}{9c^{3/2}}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x^2))-2/9*b*EllipticF(x*c^(1/2),I)/c^(3/2)+2/9*b*x*(-
c^2*x^4+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 327, 227}

$$\int x^2(a+b\arcsin(cx^2))\,dx=\frac{1}{3}x^3(a+b\arcsin(cx^2))-\frac{2b\,\text{EllipticF}(\arcsin(\sqrt{c}x),-1)}{9c^{3/2}}+\frac{2bx\sqrt{1-c^2x^4}}{9c}$$

```
[In] Int[x^2*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (2*b*x*Sqrt[1 - c^2*x^4])/(9*c) + (x^3*(a + b*ArcSin[c*x^2]))/3 - (2*b*Elli
pticF[ArcSin[Sqrt[c]*x], -1])/(9*c^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}x^3\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{3}b\int\frac{2cx^4}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{1}{3}x^3\left(a+b\arcsin\left(cx^2\right)\right)-\frac{1}{3}(2bc)\int\frac{x^4}{\sqrt{1-c^2x^4}}\,dx\\
&= \frac{2bx\sqrt{1-c^2x^4}}{9c}+\frac{1}{3}x^3\left(a+b\arcsin\left(cx^2\right)\right)-\frac{(2b)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx}{9c}\\
&= \frac{2bx\sqrt{1-c^2x^4}}{9c}+\frac{1}{3}x^3\left(a+b\arcsin\left(cx^2\right)\right)-\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{9c^{3/2}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.18

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{9}\left(3ax^3+\frac{2bx\sqrt{1-c^2x^4}}{c}+3bx^3\arcsin\left(cx^2\right)-\frac{2ib\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{(-c)^{3/2}}\right)$$

```
[In] Integrate[x^2*(a + b*ArcSin[c*x^2]),x]
```

```
[Out] (3*a*x^3 + (2*b*x*Sqrt[1 - c^2*x^4])/c + 3*b*x^3*ArcSin[c*x^2] - ((2*I)*b*E
llipticF[I*ArcSinh[Sqrt[-c]*x], -1])/(-c)^(3/2))/9
```

Maple [A] (verified)

Time = 0.54 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.44

method	result	size
default	$\frac{x^3 a}{3}+b\left(\frac{x^3 \arcsin\left(c\,x^2\right)}{3}-\frac{2c\left(-\frac{x\sqrt{-c^2x^4+1}}{3c^2}+\frac{\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{3c^{\frac{5}{2}}\sqrt{-c^2x^4+1}}\right)}{3}\right)$	88
parts	$\frac{x^3 a}{3}+b\left(\frac{x^3 \arcsin\left(c\,x^2\right)}{3}-\frac{2c\left(-\frac{x\sqrt{-c^2x^4+1}}{3c^2}+\frac{\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{3c^{\frac{5}{2}}\sqrt{-c^2x^4+1}}\right)}{3}\right)$	88

```
[In] int(x^2*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*x^3*a+b*(1/3*x^3*arcsin(c*x^2)-2/3*c*(-1/3/c^2*x*(-c^2*x^4+1)^(1/2)+1/3
/c^(5/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*c^
(1/2),I)))
```

Fricas [A] (verification not implemented)

none

Time = 0.08 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.69

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{3\,bcx^3\arcsin\left(cx^2\right)+3\,acx^3+2\,\sqrt{-c^2x^4+1}bx}{9\,c}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*b*c*x^3*arcsin(c*x^2) + 3*a*c*x^3 + 2*sqrt(-c^2*x^4 + 1)*b*x)/c
```

Sympy [A] (verification not implemented)

Time = 0.93 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.95

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^3}{3}-\frac{bcx^5\Gamma\left(\frac{5}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{6\Gamma\left(\frac{9}{4}\right)}+\frac{bx^3\operatorname{asin}\left(cx^2\right)}{3}$$

```
[In] integrate(x**2*(a+b*asin(c*x**2)),x)
[Out] a*x**3/3 - b*c*x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), c**2*x**4*exp_pola
r(2*I*pi))/(6*gamma(9/4)) + b*x**3*asin(c*x**2)/3
```

Maxima [F]

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\int\left(b\arcsin\left(cx^2\right)+a\right)x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
[Out] 1/3*a*x^3 + 1/3*(x^3*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 6*c
*integrate(1/3*x^4*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 -
c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1)), x))*b
```

Giac [F]

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\int\left(b\arcsin\left(cx^2\right)+a\right)x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^2) + a)*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\int x^2\left(a+b\operatorname{asin}\left(c\,x^2\right)\right)\,dx$$

```
[In] int(x^2*(a + b*asin(c*x^2)),x)
[Out] int(x^2*(a + b*asin(c*x^2)), x)
```

3.355 $\int (a+b\arcsin(cx^2))\,dx$

Optimal result

Integrand size = 10, antiderivative size = 49

$$\int (a+b\arcsin(cx^2))\,dx = ax+bx\arcsin(cx^2)-\frac{2bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{\sqrt{c}}+\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}}$$

```
[Out] a*x+b*x*arcsin(c*x^2)-2*b*EllipticE(x*c^(1/2),I)/c^(1/2)+2*b*EllipticF(x*c^
(1/2),I)/c^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4924, 12, 313, 227, 1213, 435}

$$\int (a+b\arcsin(cx^2))\,dx = ax+bx\arcsin(cx^2)+\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}}-\frac{2bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{\sqrt{c}}$$

```
[In] Int[a + b*ArcSin[c*x^2],x]
```

```
[Out] a*x + b*x*ArcSin[c*x^2] - (2*b*EllipticE[ArcSin[Sqrt[c]*x], -1])/Sqrt[c] +
(2*b*EllipticF[ArcSin[Sqrt[c]*x], -1])/Sqrt[c]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 313

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Dist[-q^(-1), Int[1/Sqrt[a + b*x^4], x], x] + Dist[1/q, Int[(1 + q*x^2)/Sqr
t[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 1213

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (c_.)*(x_)^4], x_Symbol] :> Dist[d/Sq
rt[a], Int[Sqrt[1 + e*(x^2/d)]/Sqrt[1 - e*(x^2/d)], x], x] /; FreeQ[{a, c,
d, e}, x] && NegQ[c/a] && EqQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= ax + b\int \arcsin\left(cx^2\right)\,dx \\
&= ax + bx\arcsin\left(cx^2\right) - b\int \frac{2cx^2}{\sqrt{1-c^2x^4}}\,dx \\
&= ax + bx\arcsin\left(cx^2\right) - (2bc)\int \frac{x^2}{\sqrt{1-c^2x^4}}\,dx \\
&= ax + bx\arcsin\left(cx^2\right) + (2b)\int \frac{1}{\sqrt{1-c^2x^4}}\,dx - (2b)\int \frac{1+cx^2}{\sqrt{1-c^2x^4}}\,dx \\
&= ax + bx\arcsin\left(cx^2\right) + \frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}} - (2b)\int \frac{\sqrt{1+cx^2}}{\sqrt{1-cx^2}}\,dx \\
&= ax + bx\arcsin\left(cx^2\right) - \frac{2bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{\sqrt{c}} + \frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 10.01 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.80

$$\int (a+b\arcsin(cx^2))\,dx = ax+bx\arcsin(cx^2)-\frac{2}{3}bcx^3\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},c^2x^4\right)$$

```
[In] Integrate[a + b*ArcSin[c*x^2],x]
[Out] a*x + b*x*ArcSin[c*x^2] - (2*b*c*x^3*Hypergeometric2F1[1/2, 3/4, 7/4, c^2*x
^4])/3
```

Maple [A] (verified)

Time = 0.54 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.45

method	result	size
default	$ax+b\left(x\arcsin(c\,x^2)+\frac{2\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\text{EllipticF}(x\sqrt{c},i)-\text{EllipticE}(x\sqrt{c},i))}{\sqrt{c}\,\sqrt{-c^2x^4+1}}\right)$	71
parts	$ax+b\left(x\arcsin(c\,x^2)+\frac{2\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\text{EllipticF}(x\sqrt{c},i)-\text{EllipticE}(x\sqrt{c},i))}{\sqrt{c}\,\sqrt{-c^2x^4+1}}\right)$	71

```
[In] int(a+b*arcsin(c*x^2),x,method=_RETURNVERBOSE)
[Out] a*x+b*(x*arcsin(c*x^2)+2/c^(1/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4
+1)^(1/2)*(EllipticF(x*c^(1/2),I)-EllipticE(x*c^(1/2),I)))
```

Fricas [A] (verification not implemented)

none

Time = 0.09 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.84

$$\int (a+b\arcsin(cx^2))\,dx = \frac{bcx^2\arcsin(cx^2)+acx^2+2\sqrt{-c^2x^4+1}b}{cx}$$

```
[In] integrate(a+b*arcsin(c*x^2),x, algorithm="fricas")
[Out] (b*c*x^2*arcsin(c*x^2) + a*c*x^2 + 2*sqrt(-c^2*x^4 + 1)*b)/(c*x)
```

Sympy [A] (verification not implemented)

Time = 0.59 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00

$$\int \left(a+b\arcsin \left(cx^2\right)\right)\,dx=ax+b\left(-\frac{cx^3\Gamma\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{2\Gamma\left(\frac{7}{4}\right)}+x\operatorname{asin}\left(cx^2\right)\right)$$

```
[In] integrate(a+b*asin(c*x**2),x)
[Out] a*x + b*(-c*x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), c**2*x**4*exp_polar(2
*I*pi))/(2*gamma(7/4)) + x*asin(c*x**2))
```

Maxima [F]

$$\int \left(a+b\arcsin \left(cx^2\right)\right)\,dx=\int b\arcsin \left(cx^2\right)+a\,dx$$

```
[In] integrate(a+b*arcsin(c*x^2),x, algorithm="maxima")
[Out] (x*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 2*c*integrate(x^2*e^(
1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 - c^2*x^4 + (c^2*x^4 - 1
)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b + a*x
```

Giac [F]

$$\int \left(a+b\arcsin \left(cx^2\right)\right)\,dx=\int b\arcsin \left(cx^2\right)+a\,dx$$

```
[In] integrate(a+b*arcsin(c*x^2),x, algorithm="giac")
[Out] integrate(b*arcsin(c*x^2) + a, x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(cx^2\right)\right)\,dx=\int a+b\,\mathrm{asin}\left(c\,x^2\right)\,dx$$

```
[In] int(a + b*asin(c*x^2),x)
[Out] int(a + b*asin(c*x^2), x)
```

3.356 $\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 34

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = -\frac{a+b\arcsin(cx^2)}{x} + 2b\sqrt{c}\,\mathrm{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

```
[Out] (-a-b*arcsin(c*x^2))/x+2*b*EllipticF(x*c^(1/2),I)*c^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 227}

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = 2b\sqrt{c}\,\mathrm{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right) - \frac{a+b\arcsin(cx^2)}{x}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^2,x]
[Out] -((a + b*ArcSin[c*x^2])/x) + 2*b*Sqrt[c]*EllipticF[ArcSin[Sqrt[c]*x], -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx^2)}{x}+b\int\frac{2c}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin(cx^2)}{x}+(2bc)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin(cx^2)}{x}+2b\sqrt{c}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}\,x\right),-1\right)
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.05 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.29

$$\int\frac{a+b\arcsin(cx^2)}{x^2}\,dx=-\frac{a+b\arcsin(cx^2)-2ib\sqrt{-c}\,x\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}\,x\right),-1\right)}{x}$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^2,x]
[Out] -((a + b*ArcSin[c*x^2] - (2*I)*b*Sqrt[-c]*x*EllipticF[I*ArcSinh[Sqrt[-c]*x]
, -1])/x)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 65 vs. 2(32) = 64.

Time = 0.39 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.94

method	result	size
default	$-\frac{a}{x}+b\left(-\frac{\arcsin(cx^2)}{x}+\frac{2\sqrt{c}\,\sqrt{-cx^2+1}\,\sqrt{cx^2+1}\,\text{EllipticF}(x\sqrt{c},i)}{\sqrt{-c^2x^4+1}}\right)$	66
parts	$-\frac{a}{x}+b\left(-\frac{\arcsin(cx^2)}{x}+\frac{2\sqrt{c}\,\sqrt{-cx^2+1}\,\sqrt{cx^2+1}\,\text{EllipticF}(x\sqrt{c},i)}{\sqrt{-c^2x^4+1}}\right)$	66

[In] int((a+b*arcsin(c*x^2))/x^2,x,method=_RETURNVERBOSE)

[Out] -a/x+b*(-1/x*arcsin(c*x^2)+2*c^(1/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*c^(1/2),I))

Fricas [A] (verification not implemented)

none

Time = 0.11 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.32

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^2}\,dx=\frac{bx\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)+(bx-b)\arcsin\left(cx^2\right)-a}{x}$$

[In] integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="fricas")

[Out] (b*x*arctan(sqrt(-c^2*x^4 + 1)/(c*x^2)) + (b*x - b)*arcsin(c*x^2) - a)/x

Sympy [A] (verification not implemented)

Time = 0.76 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.44

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^2}\,dx=-\frac{a}{x}+\frac{bcx\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\\frac{5}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{2\Gamma\left(\frac{5}{4}\right)}-\frac{b\,\mathrm{asin}\left(cx^2\right)}{x}$$

[In] integrate((a+b*asin(c*x**2))/x**2,x)

[Out] -a/x + b*c*x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), c**2*x**4*exp_polar(2*I*pi))/(2*gamma(5/4)) - b*asin(c*x**2)/x

Maxima [F]

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^2}\,dx=\int \frac{b\arcsin\left(cx^2\right)+a}{x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="maxima")

[Out] -(2*c*x*integrate(e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 - c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x - a/x

Giac [F]

$$\int \frac{a + b \arcsin(cx^2)}{x^2} dx = \int \frac{b \arcsin(cx^2) + a}{x^2} dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^2) + a)/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^2)}{x^2} dx = \int \frac{a + b \operatorname{asin}(c x^2)}{x^2} dx$$

```
[In] int((a + b*asin(c*x^2))/x^2,x)
[Out] int((a + b*asin(c*x^2))/x^2, x)
```

3.357 $\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 81

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx=-\frac{2bc\sqrt{1-c^2x^4}}{3x}-\frac{a+b\arcsin(cx^2)}{3x^3}-\frac{2}{3}bc^{3/2}E\left(\arcsin\left(\sqrt{c}x\right)|-1\right)+\frac{2}{3}bc^{3/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

```
[Out] 1/3*(-a-b*arcsin(c*x^2))/x^3-2/3*b*c^(3/2)*EllipticE(x*c^(1/2),I)+2/3*b*c^(
3/2)*EllipticF(x*c^(1/2),I)-2/3*b*c*(-c^2*x^4+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4926, 12, 331, 313, 227, 1213, 435}

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx=-\frac{a+b\arcsin(cx^2)}{3x^3}+\frac{2}{3}bc^{3/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{2}{3}bc^{3/2}E\left(\arcsin\left(\sqrt{c}x\right)|-1\right)-\frac{2bc\sqrt{1-c^2x^4}}{3x}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^4,x]
```

```
[Out] (-2*b*c*Sqrt[1 - c^2*x^4])/(3*x) - (a + b*ArcSin[c*x^2])/(3*x^3) - (2*b*c^(
3/2)*EllipticE[ArcSin[Sqrt[c]*x], -1])/3 + (2*b*c^(3/2)*EllipticF[ArcSin[Sq
rt[c]*x], -1])/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 313

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Dist[-q^(-1), Int[1/Sqrt[a + b*x^4], x], x] + Dist[1/q, Int[(1 + q*x^2)/Sqr
t[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 1213

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (c_.)*(x_)^4], x_Symbol] :> Dist[d/Sq
rt[a], Int[Sqrt[1 + e*(x^2/d)]/Sqrt[1 - e*(x^2/d)], x], x] /; FreeQ[{a, c,
d, e}, x] && NegQ[c/a] && EqQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx^2)}{3x^3}+\frac{1}{3}b\int\frac{2c}{x^2\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin(cx^2)}{3x^3}+\frac{1}{3}(2bc)\int\frac{1}{x^2\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{3x}-\frac{a+b\arcsin(cx^2)}{3x^3}-\frac{1}{3}\left(2bc^3\right)\int\frac{x^2}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{3x}-\frac{a+b\arcsin(cx^2)}{3x^3}+\frac{1}{3}\left(2bc^2\right)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx-\frac{1}{3}\left(2bc^2\right)\int\frac{1+cx^2}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{3x}-\frac{a+b\arcsin(cx^2)}{3x^3}\\
&\quad+\frac{2}{3}bc^{3/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{1}{3}\left(2bc^2\right)\int\frac{\sqrt{1+cx^2}}{\sqrt{1-cx^2}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{3x}-\frac{a+b\arcsin(cx^2)}{3x^3}\\
&\quad-\frac{2}{3}bc^{3/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)+\frac{2}{3}bc^{3/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.14 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.10

$$
\int\frac{a+b\arcsin(cx^2)}{x^4}\,dx = -\frac{a+2bcx^2\sqrt{1-c^2x^4}+b\arcsin(cx^2)+2ib\sqrt{-c}cx^3\left(E\left(i\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right)-\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-}\right.\right.\right.}{3x^3}
$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^4,x]
```

```
[Out] -1/3*(a + 2*b*c*x^2*Sqrt[1 - c^2*x^4] + b*ArcSin[c*x^2] + (2*I)*b*Sqrt[-c]*
c*x^3*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-c]*
x], -1]))/x^3
```

Maple [A] (verified)

Time = 0.50 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.20

method	result	size
default	$-\frac{a}{3x^3}+b\left(-\frac{\arcsin(c\,x^2)}{3x^3}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{x}+\frac{\sqrt{c}\,\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{\sqrt{-c^2x^4+1}}\right)}{3}\right)$	97
parts	$-\frac{a}{3x^3}+b\left(-\frac{\arcsin(c\,x^2)}{3x^3}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{x}+\frac{\sqrt{c}\,\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{\sqrt{-c^2x^4+1}}\right)}{3}\right)$	97

```
[In] int((a+b*arcsin(c*x^2))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/x^3+b*(-1/3/x^3*arcsin(c*x^2)+2/3*c*(-(-c^2*x^4+1)^(1/2)/x+c^(1/2)*(
-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*(EllipticF(x*c^(1/2),I)-
EllipticE(x*c^(1/2),I))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx=\int \frac{b\arcsin(cx^2)+a}{x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x^2) + a)/x^4, x)
```

Sympy [A] (verification not implemented)

Time = 0.97 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.74

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx=-\frac{a}{3x^3}+\frac{bc\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{6x\Gamma\left(\frac{3}{4}\right)}-\frac{b\,\mathrm{asin}(cx^2)}{3x^3}$$

```
[In] integrate((a+b*asin(c*x**2))/x**4,x)
```

```
[Out] -a/(3*x**3) + b*c*gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), c**2*x**4*exp_pola
r(2*I*pi))/(6*x*gamma(3/4)) - b*asin(c*x**2)/(3*x**3)
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx^2)}{x^4} dx = \int \frac{b \arcsin(cx^2) + a}{x^4} dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*(6*c*x^3*integrate(1/3*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c
^4*x^10 - c^2*x^6 + (c^2*x^6 - x^2)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))),
x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^3 - 1/3*a/x^3
```

Giac [F]

$$\int \frac{a + b \arcsin(cx^2)}{x^4} dx = \int \frac{b \arcsin(cx^2) + a}{x^4} dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^2) + a)/x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^2)}{x^4} dx = \int \frac{a + b \operatorname{asin}(c x^2)}{x^4} dx$$

```
[In] int((a + b*asin(c*x^2))/x^4,x)
```

```
[Out] int((a + b*asin(c*x^2))/x^4, x)
```

3.358 $\int \frac{a+b \arcsin(cx^2)}{x^6} dx$

Optimal result

Integrand size = 14, antiderivative size = 61

$$\int \frac{a+b \arcsin(cx^2)}{x^6} dx = -\frac{2bc\sqrt{1-c^2x^4}}{15x^3} - \frac{a+b \arcsin(cx^2)}{5x^5} + \frac{2}{15}bc^{5/2} \operatorname{EllipticF}\left(\arcsin\left(\sqrt{c}x\right), -1\right)$$

```
[Out] 1/5*(-a-b*arcsin(c*x^2))/x^5+2/15*b*c^(5/2)*EllipticF(x*c^(1/2),I)-2/15*b*c
*(-c^2*x^4+1)^(1/2)/x^3
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {4926, 12, 331, 227}

$$\int \frac{a+b \arcsin(cx^2)}{x^6} dx = -\frac{a+b \arcsin(cx^2)}{5x^5} + \frac{2}{15}bc^{5/2} \operatorname{EllipticF}\left(\arcsin\left(\sqrt{c}x\right), -1\right) - \frac{2bc\sqrt{1-c^2x^4}}{15x^3}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^6,x]
```

```
[Out] (-2*b*c*Sqrt[1 - c^2*x^4])/(15*x^3) - (a + b*ArcSin[c*x^2])/(5*x^5) + (2*b*
c^(5/2)*EllipticF[ArcSin[Sqrt[c]*x], -1])/15
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx^2)}{5x^5}+\frac{1}{5}b\int\frac{2c}{x^4\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin(cx^2)}{5x^5}+\frac{1}{5}(2bc)\int\frac{1}{x^4\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{15x^3}-\frac{a+b\arcsin(cx^2)}{5x^5}+\frac{1}{15}\left(2bc^3\right)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{15x^3}-\frac{a+b\arcsin(cx^2)}{5x^5}+\frac{2}{15}bc^{5/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.18

$$\int\frac{a+b\arcsin(cx^2)}{x^6}\,dx = -\frac{3a+2bcx^2\sqrt{1-c^2x^4}+3b\arcsin(cx^2)-2ib(-c)^{5/2}x^5\,\text{EllipticF}\left(i\,\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{15x^5}$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^6,x]
[Out] -1/15*(3*a + 2*b*c*x^2*Sqrt[1 - c^2*x^4] + 3*b*ArcSin[c*x^2] - (2*I)*b*(-c)
^(5/2)*x^5*EllipticF[I*ArcSinh[Sqrt[-c]*x], -1])/x^5
```

Maple [A] (verified)

Time = 0.60 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.43

method	result	size
default	$-\frac{a}{5x^5}+b\left(-\frac{\arcsin(c\,x^2)}{5x^5}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{3x^3}+\frac{c^{\frac{3}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}(x\sqrt{c},i)}{3\sqrt{-c^2x^4+1}}\right)}{5}\right)$	87
parts	$-\frac{a}{5x^5}+b\left(-\frac{\arcsin(c\,x^2)}{5x^5}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{3x^3}+\frac{c^{\frac{3}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}(x\sqrt{c},i)}{3\sqrt{-c^2x^4+1}}\right)}{5}\right)$	87

```
[In] int((a+b*arcsin(c*x^2))/x^6,x,method=_RETURNVERBOSE)
[Out] -1/5*a/x^5+b*(-1/5/x^5*arcsin(c*x^2)+2/5*c*(-1/3*(-c^2*x^4+1)^(1/2)/x^3+1/3
*c^(3/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*c^
(1/2),I)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx=\int \frac{b\arcsin(cx^2)+a}{x^6}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x^2) + a)/x^6, x)
```

Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx=-\frac{a}{5x^5}+\frac{bc\Gamma\left(-\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{10x^3\Gamma\left(\frac{1}{4}\right)}-\frac{b\,\mathrm{asin}(cx^2)}{5x^5}$$

```
[In] integrate((a+b*asin(c*x**2))/x**6,x)
[Out] -a/(5*x**5) + b*c*gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), c**2*x**4*exp_pola
r(2*I*pi))/(10*x**3*gamma(1/4)) - b*asin(c*x**2)/(5*x**5)
```

Maxima [F]

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx = \int \frac{b\arcsin\left(cx^2\right)+a}{x^6}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="maxima")
```

```
[Out] -1/5*(10*c*x^5*integrate(1/5*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(
c^4*x^12 - c^2*x^8 + (c^2*x^8 - x^4)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))),
 x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^5 - 1/5*a/x^5
```

Giac [F]

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx = \int \frac{b\arcsin\left(cx^2\right)+a}{x^6}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^2) + a)/x^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx = \int \frac{a+b\,\mathrm{asin}\left(c\,x^2\right)}{x^6}\,dx$$

```
[In] int((a + b*asin(c*x^2))/x^6,x)
```

```
[Out] int((a + b*asin(c*x^2))/x^6, x)
```

3.359 $\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 106

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}-\frac{a+b\arcsin(cx^2)}{7x^7}-\frac{6}{35}bc^{7/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)+\frac{6}{35}bc^{7/2}\operatorname{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

```
[Out] 1/7*(-a-b*arcsin(c*x^2))/x^7-6/35*b*c^(7/2)*EllipticE(x*c^(1/2),I)+6/35*b*c
^(7/2)*EllipticF(x*c^(1/2),I)-2/35*b*c*(-c^2*x^4+1)^(1/2)/x^5-6/35*b*c^3*(-
c^2*x^4+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4926, 12, 331, 313, 227, 1213, 435}

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = -\frac{a+b\arcsin(cx^2)}{7x^7}+\frac{6}{35}bc^{7/2}\operatorname{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{6}{35}bc^{7/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)-\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}$$

```
[In] Int[(a + b*ArcSin[c*x^2])/x^8,x]
```

```
[Out] (-2*b*c*Sqrt[1 - c^2*x^4])/(35*x^5) - (6*b*c^3*Sqrt[1 - c^2*x^4])/(35*x) -
(a + b*ArcSin[c*x^2])/(7*x^7) - (6*b*c^(7/2)*EllipticE[ArcSin[Sqrt[c]*x], -
1])/35 + (6*b*c^(7/2)*EllipticF[ArcSin[Sqrt[c]*x], -1])/35
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 227

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[EllipticF[ArcSin[Rt[-b,
4]*(x/Rt[a, 4])], -1]/(Rt[a, 4]*Rt[-b, 4]), x] /; FreeQ[{a, b}, x] && NegQ[
b/a] && GtQ[a, 0]
```

Rule 313

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Dist[-q^(-1), Int[1/Sqrt[a + b*x^4], x], x] + Dist[1/q, Int[(1 + q*x^2)/Sqr
t[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 1213

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (c_.)*(x_)^4], x_Symbol] :> Dist[d/Sq
rt[a], Int[Sqrt[1 + e*(x^2/d)]/Sqrt[1 - e*(x^2/d)], x], x] /; FreeQ[{a, c,
d, e}, x] && NegQ[c/a] && EqQ[c*d^2 + a*e^2, 0] && GtQ[a, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx^2)}{7x^7}+\frac{1}{7}b\int\frac{2c}{x^6\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{a+b\arcsin(cx^2)}{7x^7}+\frac{1}{7}(2bc)\int\frac{1}{x^6\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{a+b\arcsin(cx^2)}{7x^7}+\frac{1}{35}(6bc^3)\int\frac{1}{x^2\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}-\frac{a+b\arcsin(cx^2)}{7x^7}-\frac{1}{35}(6bc^5)\int\frac{x^2}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}-\frac{a+b\arcsin(cx^2)}{7x^7}\\
&\quad+\frac{1}{35}(6bc^4)\int\frac{1}{\sqrt{1-c^2x^4}}\,dx-\frac{1}{35}(6bc^4)\int\frac{1+cx^2}{\sqrt{1-c^2x^4}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}-\frac{a+b\arcsin(cx^2)}{7x^7}\\
&\quad+\frac{6}{35}bc^{7/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{1}{35}(6bc^4)\int\frac{\sqrt{1+cx^2}}{\sqrt{1-cx^2}}\,dx\\
&= -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x}-\frac{a+b\arcsin(cx^2)}{7x^7}\\
&\quad-\frac{6}{35}bc^{7/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)+\frac{6}{35}bc^{7/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.94

$$\int\frac{a+b\arcsin(cx^2)}{x^8}\,dx = -\frac{5a+2bx^2\sqrt{1-c^2x^4}(c+3c^3x^4)+5b\arcsin(cx^2)-6ib(-c)^{7/2}x^7\left(E\left(i\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right)-\text{EllipticF}\left(\right.\right.}{35x^7}$$

```
[In] Integrate[(a + b*ArcSin[c*x^2])/x^8,x]
```

```
[Out] -1/35*(5*a + 2*b*x^2*Sqrt[1 - c^2*x^4]*(c + 3*c^3*x^4) + 5*b*ArcSin[c*x^2]
- (6*I)*b*(-c)^(7/2)*x^7*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - EllipticF[
I*ArcSinh[Sqrt[-c]*x], -1]))/x^7
```

Maple [A] (verified)

Time = 0.72 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.11

method	result
default	$-\frac{a}{7x^7}+b\left(-\frac{\arcsin(c\,x^2)}{7x^7}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{5x^5}-\frac{3c^2\sqrt{-c^2x^4+1}}{5x}+\frac{3c^{\frac{5}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\text{EllipticF}(x\sqrt{c},i)-\text{EllipticE}(x\sqrt{c},i))}{5\sqrt{-c^2x^4+1}}\right)}{7}\right)$
parts	$-\frac{a}{7x^7}+b\left(-\frac{\arcsin(c\,x^2)}{7x^7}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{5x^5}-\frac{3c^2\sqrt{-c^2x^4+1}}{5x}+\frac{3c^{\frac{5}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\text{EllipticF}(x\sqrt{c},i)-\text{EllipticE}(x\sqrt{c},i))}{5\sqrt{-c^2x^4+1}}\right)}{7}\right)$

```
[In] int((a+b*arcsin(c*x^2))/x^8,x,method=_RETURNVERBOSE)
[Out] -1/7*a/x^7+b*(-1/7/x^7*arcsin(c*x^2)+2/7*c*(-1/5/x^5*(-c^2*x^4+1)^(1/2)-3/5
*c^2*(-c^2*x^4+1)^(1/2)/x+3/5*c^(5/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^
2*x^4+1)^(1/2)*(EllipticF(x*c^(1/2),I)-EllipticE(x*c^(1/2),I))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx=\int \frac{b\arcsin(cx^2)+a}{x^8}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x^2) + a)/x^8, x)
```

Sympy [A] (verification not implemented)

Time = 1.74 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx=-\frac{a}{7x^7}+\frac{bc\Gamma\left(-\frac{5}{4}\right){}_2F_1\left(\begin{matrix}-\frac{5}{4},\frac{1}{2}\\-\frac{1}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{14x^5\Gamma\left(-\frac{1}{4}\right)}-\frac{b\,\text{asin}(cx^2)}{7x^7}$$

```
[In] integrate((a+b*asin(c*x**2))/x**8,x)
[Out] -a/(7*x**7) + b*c*gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(14*x**5*gamma(-1/4)) - b*asin(c*x**2)/(7*x**7)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = \int \frac{b\arcsin(cx^2)+a}{x^8}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="maxima")
```

```
[Out] -1/7*(14*c*x^7*integrate(1/7*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(
c^4*x^14 - c^2*x^10 + (c^2*x^10 - x^6)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))
), x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^7 - 1/7*a/x^7
```

Giac [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = \int \frac{b\arcsin(cx^2)+a}{x^8}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^2) + a)/x^8, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^8}\,dx$$

```
[In] int((a + b*asin(c*x^2))/x^8,x)
```

```
[Out] int((a + b*asin(c*x^2))/x^8, x)
```

3.360 $\int \frac{\arcsin(ax^5)}{x} dx$

Optimal result

Integrand size = 10, antiderivative size = 62

$$\int \frac{\arcsin(ax^5)}{x} dx = -\frac{1}{10} i \arcsin(ax^5)^2 + \frac{1}{5} \arcsin(ax^5) \log\left(1 - e^{2i \arcsin(ax^5)}\right) - \frac{1}{10} i \operatorname{PolyLog}\left(2, e^{2i \arcsin(ax^5)}\right)$$

```
[Out] -1/10*I*arcsin(a*x^5)^2+1/5*arcsin(a*x^5)*ln(1-(I*a*x^5+(-a^2*x^10+1)^(1/2)
)^2)-1/10*I*polylog(2,(I*a*x^5+(-a^2*x^10+1)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4914, 3798, 2221, 2317, 2438}

$$\int \frac{\arcsin(ax^5)}{x} dx = -\frac{1}{10} i \operatorname{PolyLog}\left(2, e^{2i \arcsin(ax^5)}\right) - \frac{1}{10} i \arcsin(ax^5)^2 + \frac{1}{5} \arcsin(ax^5) \log\left(1 - e^{2i \arcsin(ax^5)}\right)$$

```
[In] Int[ArcSin[a*x^5]/x,x]
```

```
[Out] (-1/10*I)*ArcSin[a*x^5]^2 + (ArcSin[a*x^5]*Log[1 - E^((2*I)*ArcSin[a*x^5])]
)/5 - (I/10)*PolyLog[2, E^((2*I)*ArcSin[a*x^5])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4914

```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Dist[1/p, Subst[Int[x^
n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{5}\text{Subst}\left(\int x\cot(x)\,dx, x, \arcsin\left(ax^5\right)\right)\\
&= -\frac{1}{10}i\arcsin\left(ax^5\right)^2 - \frac{2}{5}i\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin\left(ax^5\right)\right)\\
&= -\frac{1}{10}i\arcsin\left(ax^5\right)^2 + \frac{1}{5}\arcsin\left(ax^5\right)\log\left(1-e^{2i\arcsin\left(ax^5\right)}\right)\\
&\quad - \frac{1}{5}\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(ax^5\right)\right)\\
&= -\frac{1}{10}i\arcsin\left(ax^5\right)^2 + \frac{1}{5}\arcsin\left(ax^5\right)\log\left(1-e^{2i\arcsin\left(ax^5\right)}\right)\\
&\quad + \frac{1}{10}i\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin\left(ax^5\right)}\right)\\
&= -\frac{1}{10}i\arcsin\left(ax^5\right)^2 + \frac{1}{5}\arcsin\left(ax^5\right)\log\left(1-e^{2i\arcsin\left(ax^5\right)}\right) - \frac{1}{10}i\,\text{PolyLog}\left(2, e^{2i\arcsin\left(ax^5\right)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.94

$$\int \frac{\arcsin(ax^5)}{x} \, dx = \frac{1}{5}\left(\arcsin(ax^5)\log\left(1-e^{2i\arcsin(ax^5)}\right) - \frac{1}{2}i\left(\arcsin(ax^5)^2 + \text{PolyLog}\left(2, e^{2i\arcsin(ax^5)}\right)\right)\right)$$

```
[In] Integrate[ArcSin[a*x^5]/x,x]
[Out] (ArcSin[a*x^5]*Log[1 - E^((2*I)*ArcSin[a*x^5])] - (I/2)*(ArcSin[a*x^5]^2 +
PolyLog[2, E^((2*I)*ArcSin[a*x^5])]))/5
```

Maple [F]

$$\int \frac{\arcsin(a\,x^5)}{x}dx$$

```
[In] int(arcsin(a*x^5)/x,x)
[Out] int(arcsin(a*x^5)/x,x)
```

Fricas [F]

$$\int \frac{\arcsin(ax^5)}{x} \, dx = \int \frac{\arcsin(ax^5)}{x} \, dx$$

```
[In] integrate(arcsin(a*x^5)/x,x, algorithm="fricas")
[Out] integral(arcsin(a*x^5)/x, x)
```

Sympy [F]

$$\int \frac{\arcsin(ax^5)}{x} \, dx = \int \frac{\operatorname{asin}(ax^5)}{x} \, dx$$

```
[In] integrate(asin(a*x**5)/x,x)
[Out] Integral(asin(a*x**5)/x, x)
```

Maxima [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\arcsin(ax^5)}{x}\,dx$$

```
[In] integrate(arcsin(a*x^5)/x,x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x^5)/x, x)
```

Giac [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\arcsin(ax^5)}{x}\,dx$$

```
[In] integrate(arcsin(a*x^5)/x,x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x^5)/x, x)
```

Mupad [B] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.81

$$\int \frac{\arcsin(ax^5)}{x}\,dx = -\frac{\mathrm{polylog}\left(2, \mathrm{e}^{\mathrm{asin}(a\,x^5)\,2\mathrm{i}}\right)\,1\mathrm{i}}{10} + \frac{\ln\left(1-\mathrm{e}^{\mathrm{asin}(a\,x^5)\,2\mathrm{i}}\right)\,\mathrm{asin}(a\,x^5)}{5} - \frac{\mathrm{asin}(a\,x^5)^2\,1\mathrm{i}}{10}$$

```
[In] int(asin(a*x^5)/x,x)
```

```
[Out] (log(1 - exp(asin(a*x^5)*2i))*asin(a*x^5))/5 - (polylog(2, exp(asin(a*x^5)*
2i))*1i)/10 - (asin(a*x^5)^2*1i)/10
```

3.361 $\int x^2 \arcsin(\sqrt{x})\,dx$

Optimal result

Integrand size = 10, antiderivative size = 78

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{5}{48}\sqrt{1-x}\sqrt{x} + \frac{5}{72}\sqrt{1-x}x^{3/2} + \frac{1}{18}\sqrt{1-x}x^{5/2} + \frac{5}{96}\arcsin(1-2x) + \frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)$$

```
[Out] -5/96*arcsin(-1+2*x)+1/3*x^3*arcsin(x^(1/2))+5/72*x^(3/2)*(1-x)^(1/2)+1/18*
x^(5/2)*(1-x)^(1/2)+5/48*(1-x)^(1/2)*x^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4926, 12, 52, 55, 633, 222}

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{3}x^3\arcsin\left(\sqrt{x}\right) + \frac{5}{96}\arcsin(1-2x) + \frac{1}{18}\sqrt{1-x}x^{5/2} + \frac{5}{72}\sqrt{1-x}x^{3/2} + \frac{5}{48}\sqrt{1-x}\sqrt{x}$$

```
[In] Int[x^2*ArcSin[Sqrt[x]],x]
```

```
[Out] (5*Sqrt[1 - x]*Sqrt[x])/48 + (5*Sqrt[1 - x]*x^(3/2))/72 + (Sqrt[1 - x]*x^(5
/2))/18 + (5*ArcSin[1 - 2*x])/96 + (x^3*ArcSin[Sqrt[x]])/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 52

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Dist[n*((b*c - a*d)/(
b*(m + n + 1))), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 55

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{1}{3}\int\frac{x^{5/2}}{2\sqrt{1-x}}\,dx\\
&= \frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{1}{6}\int\frac{x^{5/2}}{\sqrt{1-x}}\,dx\\
&= \frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{5}{36}\int\frac{x^{3/2}}{\sqrt{1-x}}\,dx\\
&= \frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{5}{48}\int\frac{\sqrt{x}}{\sqrt{1-x}}\,dx
\end{aligned}$$

$$= \frac{5}{48}\sqrt{1-x}\sqrt{x}+\frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{5}{96}\int\frac{1}{\sqrt{1-x}\sqrt{x}}\,dx$$

$$= \frac{5}{48}\sqrt{1-x}\sqrt{x}+\frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)-\frac{5}{96}\int\frac{1}{\sqrt{x-x^2}}\,dx$$

$$= \frac{5}{48}\sqrt{1-x}\sqrt{x}+\frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2} + \frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)+\frac{5}{96}\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,1-2x\right)$$

$$= \frac{5}{48}\sqrt{1-x}\sqrt{x}+\frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{5}{96}\arcsin(1-2x)+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.82

$$\int x^2\arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{144}\left(10\sqrt{1-x}x^{3/2}+8\sqrt{1-x}x^{5/2}+15\sqrt{-((-1+x)x)} + 3\left(-5+16x^3\right)\arcsin\left(\sqrt{x}\right)\right)$$

```
[In] Integrate[x^2*ArcSin[Sqrt[x]],x]
[Out] (10*Sqrt[1 - x]*x^(3/2) + 8*Sqrt[1 - x]*x^(5/2) + 15*Sqrt[-((-1 + x)*x)] +
3*(-5 + 16*x^3)*ArcSin[Sqrt[x]])/144
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.68

method	result	size
derivativedivides	$\frac{x^3\arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\arcsin(\sqrt{x})}{48}$	53
default	$\frac{x^3\arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\arcsin(\sqrt{x})}{48}$	53
parts	$\frac{x^3\arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\sqrt{x(1-x)}\,\arcsin(-1+2x)}{96\sqrt{x}\,\sqrt{1-x}}$	74

```
[In] int(x^2*arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
[Out] 1/3*x^3*arcsin(x^(1/2))+1/18*x^(5/2)*(1-x)^(1/2)+5/72*x^(3/2)*(1-x)^(1/2)+5
/48*(1-x)^(1/2)*x^(1/2)-5/48*arcsin(x^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.46

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{144}\left(8\,x^2+10\,x+15\right)\sqrt{x}\sqrt{-x+1}+\frac{1}{48}\left(16\,x^3-5\right)\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(x^2*arcsin(x^(1/2)),x, algorithm="fricas")
[Out] 1/144*(8*x^2 + 10*x + 15)*sqrt(x)*sqrt(-x + 1) + 1/48*(16*x^3 - 5)*arcsin(s
qrt(x))
```

Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.69

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{x^3 \operatorname{asin}\left(\sqrt{x}\right)}{3}-\frac{\sqrt{1-x}\left(-\frac{x^{\frac{5}{2}}}{6}-\frac{5x^{\frac{3}{2}}}{24}-\frac{5\sqrt{x}}{16}\right)}{3}-\frac{5\operatorname{asin}\left(\sqrt{x}\right)}{48}$$

```
[In] integrate(x**2*asin(x**(1/2)),x)
[Out] x**3*asin(sqrt(x))/3 - sqrt(1 - x)*(-x**(5/2)/6 - 5*x**(3/2)/24 - 5*sqrt(x)
/16)/3 - 5*asin(sqrt(x))/48
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.67

$$\begin{aligned}\int x^2 \arcsin\left(\sqrt{x}\right)\,dx &= \frac{1}{3}\,x^3\arcsin\left(\sqrt{x}\right)+\frac{1}{18}\,x^{\frac{5}{2}}\sqrt{-x+1}+\frac{5}{72}\,x^{\frac{3}{2}}\sqrt{-x+1} \\ &\quad+\frac{5}{48}\,\sqrt{x}\sqrt{-x+1}-\frac{5}{48}\,\arcsin\left(\sqrt{x}\right)\end{aligned}$$

```
[In] integrate(x^2*arcsin(x^(1/2)),x, algorithm="maxima")
[Out] 1/3*x^3*arcsin(sqrt(x)) + 1/18*x^(5/2)*sqrt(-x + 1) + 5/72*x^(3/2)*sqrt(-x
+ 1) + 5/48*sqrt(x)*sqrt(-x + 1) - 5/48*arcsin(sqrt(x))
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.99

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{3}\,(x-1)^3\arcsin\left(\sqrt{x}\right) + \frac{1}{18}\,(x-1)^2\sqrt{x}\sqrt{-x+1} + (x-1)^2\arcsin\left(\sqrt{x}\right) - \frac{13}{72}\,\sqrt{x}(-x+1)^{\frac{3}{2}} + (x-1)\arcsin\left(\sqrt{x}\right) + \frac{11}{48}\,\sqrt{x}\sqrt{-x+1} + \frac{11}{48}\,\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(x^2*arcsin(x^(1/2)),x, algorithm="giac")
```

```
[Out] 1/3*(x - 1)^3*arcsin(sqrt(x)) + 1/18*(x - 1)^2*sqrt(x)*sqrt(-x + 1) + (x -
1)^2*arcsin(sqrt(x)) - 13/72*sqrt(x)*(-x + 1)^(3/2) + (x - 1)*arcsin(sqrt(x
)) + 11/48*sqrt(x)*sqrt(-x + 1) + 11/48*arcsin(sqrt(x))
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \int x^2\,\mathrm{asin}\left(\sqrt{x}\right)\,dx$$

```
[In] int(x^2*asin(x^(1/2)),x)
```

```
[Out] int(x^2*asin(x^(1/2)), x)
```

3.362 $\int x \arcsin(\sqrt{x})\,dx$

Optimal result

Integrand size = 8, antiderivative size = 60

$$\int x \arcsin\left(\sqrt{x}\right)\,dx = \frac{3}{16}\sqrt{1-x}\sqrt{x}+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{3}{32}\arcsin(1-2x)+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)$$

```
[Out] -3/32*arcsin(-1+2*x)+1/2*x^2*arcsin(x^(1/2))+1/8*x^(3/2)*(1-x)^(1/2)+3/16*(
1-x)^(1/2)*x^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {4926, 12, 52, 55, 633, 222}

$$\int x \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)+\frac{3}{32}\arcsin(1-2x)+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{3}{16}\sqrt{1-x}\sqrt{x}$$

```
[In] Int[x*ArcSin[Sqrt[x]],x]
```

```
[Out] (3*Sqrt[1 - x]*Sqrt[x])/16 + (Sqrt[1 - x]*x^(3/2))/8 + (3*ArcSin[1 - 2*x])/
32 + (x^2*ArcSin[Sqrt[x]])/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 52

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Dist[n*((b*c - a*d)/(
```

```
b*(m + n + 1))), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 55

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)-\frac{1}{2}\int\frac{x^{3/2}}{2\sqrt{1-x}}\,dx\\
&= \frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)-\frac{1}{4}\int\frac{x^{3/2}}{\sqrt{1-x}}\,dx\\
&= \frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)-\frac{3}{16}\int\frac{\sqrt{x}}{\sqrt{1-x}}\,dx\\
&= \frac{3}{16}\sqrt{1-x}\sqrt{x}+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)-\frac{3}{32}\int\frac{1}{\sqrt{1-x}\sqrt{x}}\,dx\\
&= \frac{3}{16}\sqrt{1-x}\sqrt{x}+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)-\frac{3}{32}\int\frac{1}{\sqrt{x-x^2}}\,dx
\end{aligned}$$

$$=\frac{3}{16}\sqrt{1-x}\sqrt{x}+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)+\frac{3}{32}\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,1-2x\right)$$
$$=\frac{3}{16}\sqrt{1-x}\sqrt{x}+\frac{1}{8}\sqrt{1-x}x^{3/2}+\frac{3}{32}\arcsin(1-2x)+\frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.78

$$\int x\arcsin\left(\sqrt{x}\right)\,dx=\frac{1}{16}\left(2\sqrt{1-x}x^{3/2}+3\sqrt{-((-1+x)x)}+\left(-3+8x^2\right)\arcsin\left(\sqrt{x}\right)\right)$$

```
[In] Integrate[x*ArcSin[Sqrt[x]],x]
[Out] (2*Sqrt[1 - x]*x^(3/2) + 3*Sqrt[-((-1 + x)*x)] + (-3 + 8*x^2)*ArcSin[Sqrt[x
]])/16
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.68

method	result	size
derivativedivides	$\frac{x^2\arcsin(\sqrt{x})}{2}+\frac{x^{\frac{3}{2}}\sqrt{1-x}}{8}+\frac{3\sqrt{1-x}\,\sqrt{x}}{16}-\frac{3\arcsin(\sqrt{x})}{16}$	41
default	$\frac{x^2\arcsin(\sqrt{x})}{2}+\frac{x^{\frac{3}{2}}\sqrt{1-x}}{8}+\frac{3\sqrt{1-x}\,\sqrt{x}}{16}-\frac{3\arcsin(\sqrt{x})}{16}$	41
parts	$\frac{x^2\arcsin(\sqrt{x})}{2}+\frac{x^{\frac{3}{2}}\sqrt{1-x}}{8}+\frac{3\sqrt{1-x}\,\sqrt{x}}{16}-\frac{3\sqrt{x(1-x)}\,\arcsin(-1+2x)}{32\sqrt{x}\,\sqrt{1-x}}$	62

```
[In] int(x*arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
[Out] 1/2*x^2*arcsin(x^(1/2))+1/8*x^(3/2)*(1-x)^(1/2)+3/16*(1-x)^(1/2)*x^(1/2)-3/
16*arcsin(x^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.52

$$\int x\arcsin\left(\sqrt{x}\right)\,dx=\frac{1}{16}\,(2\,x+3)\sqrt{x}\sqrt{-x+1}+\frac{1}{16}\left(8\,x^2-3\right)\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(x*arcsin(x^(1/2)),x, algorithm="fricas")
[Out] 1/16*(2*x + 3)*sqrt(x)*sqrt(-x + 1) + 1/16*(8*x^2 - 3)*arcsin(sqrt(x))
```

Sympy [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.77

$$\int x \arcsin\left(\sqrt{x}\right)\,dx = \frac{x^2 \operatorname{asin}\left(\sqrt{x}\right)}{2} - \frac{\sqrt{1-x}\left(-\frac{x^{\frac{3}{2}}}{4} - \frac{3\sqrt{x}}{8}\right)}{2} - \frac{3\operatorname{asin}\left(\sqrt{x}\right)}{16}$$

```
[In] integrate(x*asin(x**(1/2)),x)
```

```
[Out] x**2*asin(sqrt(x))/2 - sqrt(1 - x)*(-x**(3/2)/4 - 3*sqrt(x)/8)/2 - 3*asin(s
qrt(x))/16
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.67

$$\int x \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}\,x^2 \arcsin\left(\sqrt{x}\right) + \frac{1}{8}\,x^{\frac{3}{2}}\sqrt{-x+1} + \frac{3}{16}\,\sqrt{x}\sqrt{-x+1} - \frac{3}{16}\,\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(x*arcsin(x^(1/2)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arcsin(sqrt(x)) + 1/8*x^(3/2)*sqrt(-x + 1) + 3/16*sqrt(x)*sqrt(-x +
 1) - 3/16*arcsin(sqrt(x))
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.83

$$\int x \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}\,(x-1)^2 \arcsin\left(\sqrt{x}\right) - \frac{1}{8}\,\sqrt{x}(-x+1)^{\frac{3}{2}} + (x-1)\arcsin\left(\sqrt{x}\right) + \frac{5}{16}\,\sqrt{x}\sqrt{-x+1} + \frac{5}{16}\,\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(x*arcsin(x^(1/2)),x, algorithm="giac")
```

```
[Out] 1/2*(x - 1)^2*arcsin(sqrt(x)) - 1/8*sqrt(x)*(-x + 1)^(3/2) + (x - 1)*arcsin
(sqrt(x)) + 5/16*sqrt(x)*sqrt(-x + 1) + 5/16*arcsin(sqrt(x))
```

Mupad [F(-1)]

Timed out.

$$\int x \arcsin\left(\sqrt{x}\right) \, dx = \int x \operatorname{asin}\left(\sqrt{x}\right) \, dx$$

```
[In] int(x*asin(x^(1/2)),x)
[Out] int(x*asin(x^(1/2)), x)
```

3.363 $\int \arcsin\left(\sqrt{x}\right)\,dx$

Optimal result

Integrand size = 6, antiderivative size = 37

$$\int \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}\sqrt{1-x}\sqrt{x} + \frac{1}{4}\arcsin(1-2x) + x\arcsin\left(\sqrt{x}\right)$$

```
[Out] -1/4*arcsin(-1+2*x)+x*arcsin(x^(1/2))+1/2*(1-x)^(1/2)*x^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {4924, 12, 52, 55, 633, 222}

$$\int \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{4}\arcsin(1-2x) + x\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\sqrt{1-x}\sqrt{x}$$

```
[In] Int[ArcSin[Sqrt[x]],x]
```

```
[Out] (Sqrt[1 - x]*Sqrt[x])/2 + ArcSin[1 - 2*x]/4 + x*ArcSin[Sqrt[x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 52

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Dist[n*((b*c - a*d)/(
b*(m + n + 1))), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
```

```
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 55

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)]*Sqrt[(c_.) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= x\arcsin\left(\sqrt{x}\right)-\int\frac{\sqrt{x}}{2\sqrt{1-x}}\,dx\\
&= x\arcsin\left(\sqrt{x}\right)-\frac{1}{2}\int\frac{\sqrt{x}}{\sqrt{1-x}}\,dx\\
&= \frac{1}{2}\sqrt{1-x}\sqrt{x}+x\arcsin\left(\sqrt{x}\right)-\frac{1}{4}\int\frac{1}{\sqrt{1-x}\sqrt{x}}\,dx\\
&= \frac{1}{2}\sqrt{1-x}\sqrt{x}+x\arcsin\left(\sqrt{x}\right)-\frac{1}{4}\int\frac{1}{\sqrt{x-x^2}}\,dx\\
&= \frac{1}{2}\sqrt{1-x}\sqrt{x}+x\arcsin\left(\sqrt{x}\right)+\frac{1}{4}\text{Subst}\left(\int\frac{1}{\sqrt{1-x^2}}\,dx,x,1-2x\right)\\
&= \frac{1}{2}\sqrt{1-x}\sqrt{x}+\frac{1}{4}\arcsin(1-2x)+x\arcsin\left(\sqrt{x}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.24

$$\int \arcsin\left(\sqrt{x}\right)\,dx = x\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\left(\sqrt{-((-1+x)x)} - 2\arctan\left(\frac{\sqrt{x}}{-1+\sqrt{1-x}}\right)\right)$$

```
[In] Integrate[ArcSin[Sqrt[x]],x]
[Out] x*ArcSin[Sqrt[x]] + (Sqrt[-((-1 + x)*x)] - 2*ArcTan[Sqrt[x]/(-1 + Sqrt[1 -
x])])/2
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.70

method	result	size
derivativedivides	$x\arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\arcsin\left(\sqrt{x}\right)}{2}$	26
default	$x\arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\arcsin\left(\sqrt{x}\right)}{2}$	26
parts	$x\arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\sqrt{x(1-x)}\,\arcsin(-1+2x)}{4\sqrt{x}\,\sqrt{1-x}}$	47

```
[In] int(arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
[Out] x*arcsin(x^(1/2))+1/2*(1-x)^(1/2)*x^(1/2)-1/2*arcsin(x^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.65

$$\int \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}\,(2\,x-1)\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\,\sqrt{x}\sqrt{-x+1}$$

```
[In] integrate(arcsin(x^(1/2)),x, algorithm="fricas")
[Out] 1/2*(2*x - 1)*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1)
```

Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.78

$$\int \arcsin\left(\sqrt{x}\right)\,dx = \frac{\sqrt{x}\sqrt{1-x}}{2} + x\,\mathrm{asin}\left(\sqrt{x}\right) - \frac{\mathrm{asin}\left(\sqrt{x}\right)}{2}$$

```
[In] integrate(asin(x**(1/2)),x)
[Out] sqrt(x)*sqrt(1 - x)/2 + x*asin(sqrt(x)) - asin(sqrt(x))/2
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.68

$$\int \arcsin\left(\sqrt{x}\right)\,dx = x\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\sqrt{x}\sqrt{-x+1} - \frac{1}{2}\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(arcsin(x^(1/2)),x, algorithm="maxima")
[Out] x*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1) - 1/2*arcsin(sqrt(x))
```

Giac [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.73

$$\int \arcsin\left(\sqrt{x}\right)\,dx = (x-1)\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\sqrt{x}\sqrt{-x+1} + \frac{1}{2}\arcsin\left(\sqrt{x}\right)$$

```
[In] integrate(arcsin(x^(1/2)),x, algorithm="giac")
[Out] (x - 1)*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1) + 1/2*arcsin(sqrt(x))
```

Mupad [B] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00

$$\int \arcsin\left(\sqrt{x}\right)\,dx = x\,\mathrm{asin}\left(\sqrt{x}\right) - \mathrm{atan}\left(\frac{\sqrt{x}}{\sqrt{1-x}-1}\right) + \frac{\sqrt{x}\,\sqrt{1-x}}{2}$$

```
[In] int(asin(x^(1/2)),x)
[Out] x*asin(x^(1/2)) - atan(x^(1/2)/((1 - x)^(1/2) - 1)) + (x^(1/2)*(1 - x)^(1/2
))/2
```

3.364 $\int \frac{\arcsin(\sqrt{x})}{x} \, dx$

Optimal result

Integrand size = 10, antiderivative size = 56

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x} \, dx = -i \arcsin\left(\sqrt{x}\right)^2 + 2 \arcsin\left(\sqrt{x}\right) \log\left(1 - e^{2i \arcsin\left(\sqrt{x}\right)}\right) - i \operatorname{PolyLog}\left(2, e^{2i \arcsin\left(\sqrt{x}\right)}\right)$$

```
[Out] -I*arcsin(x^(1/2))^2+2*arcsin(x^(1/2))*ln(1-(I*x^(1/2)+(1-x)^(1/2))^2)-I*po
lylog(2,(I*x^(1/2)+(1-x)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4914, 3798, 2221, 2317, 2438}

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x} \, dx = -i \operatorname{PolyLog}\left(2, e^{2i \arcsin\left(\sqrt{x}\right)}\right) - i \arcsin\left(\sqrt{x}\right)^2 + 2 \arcsin\left(\sqrt{x}\right) \log\left(1 - e^{2i \arcsin\left(\sqrt{x}\right)}\right)$$

```
[In] Int[ArcSin[Sqrt[x]]/x,x]
```

```
[Out] (-I)*ArcSin[Sqrt[x]]^2 + 2*ArcSin[Sqrt[x]]*Log[1 - E^((2*I)*ArcSin[Sqrt[x]]
)] - I*PolyLog[2, E^((2*I)*ArcSin[Sqrt[x]])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4914

```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Dist[1/p, Subst[Int[x^
n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= 2\text{Subst}\left(\int x\cot(x)\,dx, x, \arcsin\left(\sqrt{x}\right)\right)\\
&= -i\arcsin\left(\sqrt{x}\right)^2 - 4i\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin\left(\sqrt{x}\right)\right)\\
&= -i\arcsin\left(\sqrt{x}\right)^2 + 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)\\
&\quad - 2\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(\sqrt{x}\right)\right)\\
&= -i\arcsin\left(\sqrt{x}\right)^2 + 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)\\
&\quad + i\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin\left(\sqrt{x}\right)}\right)\\
&= -i\arcsin\left(\sqrt{x}\right)^2 + 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right) - i\,\text{PolyLog}\left(2, e^{2i\arcsin\left(\sqrt{x}\right)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.95

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right) - i\left(\arcsin\left(\sqrt{x}\right)^2 + \text{PolyLog}\left(2,e^{2i\arcsin\left(\sqrt{x}\right)}\right)\right)$$

```
[In] Integrate[ArcSin[Sqrt[x]]/x,x]
[Out] 2*ArcSin[Sqrt[x]]*Log[1 - E^((2*I)*ArcSin[Sqrt[x]])] - I*(ArcSin[Sqrt[x]]^2
 + PolyLog[2, E^((2*I)*ArcSin[Sqrt[x]])])
```

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.73

method	result
derivativedivides	$-i\arcsin\left(\sqrt{x}\right)^2+2\arcsin\left(\sqrt{x}\right)\ln\left(1+i\sqrt{x}+\sqrt{1-x}\right)-2i\,\text{polylog}\left(2,-i\sqrt{x}-\sqrt{1-\right.$
default	$-i\arcsin\left(\sqrt{x}\right)^2+2\arcsin\left(\sqrt{x}\right)\ln\left(1+i\sqrt{x}+\sqrt{1-x}\right)-2i\,\text{polylog}\left(2,-i\sqrt{x}-\sqrt{1-\right.$

```
[In] int(arcsin(x^(1/2))/x,x,method=_RETURNVERBOSE)
[Out] -I*arcsin(x^(1/2))^2+2*arcsin(x^(1/2))*ln(1+I*x^(1/2)+(1-x)^(1/2))-2*I*poly
log(2,-I*x^(1/2)-(1-x)^(1/2))+2*arcsin(x^(1/2))*ln(1-I*x^(1/2)-(1-x)^(1/2))
-2*I*polylog(2,I*x^(1/2)+(1-x)^(1/2))
```

Fricas [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

```
[In] integrate(arcsin(x^(1/2))/x,x, algorithm="fricas")
[Out] integral(arcsin(sqrt(x))/x, x)
```

Sympy [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\operatorname{asin}\left(\sqrt{x}\right)}{x}\,dx$$

```
[In] integrate(asin(x**(1/2))/x,x)
[Out] Integral(asin(sqrt(x))/x, x)
```

Maxima [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

```
[In] integrate(arcsin(x^(1/2))/x,x, algorithm="maxima")
[Out] integrate(arcsin(sqrt(x))/x, x)
```

Giac [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

```
[In] integrate(arcsin(x^(1/2))/x,x, algorithm="giac")
[Out] integrate(arcsin(sqrt(x))/x, x)
```

Mupad [B] (verification not implemented)

Time = 0.54 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.75

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = -\operatorname{polylog}\left(2, \mathrm{e}^{\operatorname{asin}\left(\sqrt{x}\right)\,2\mathrm{i}}\right)\,1\mathrm{i} - \operatorname{asin}\left(\sqrt{x}\right)^2\,1\mathrm{i} + 2\,\ln\left(1 - \mathrm{e}^{\operatorname{asin}\left(\sqrt{x}\right)\,2\mathrm{i}}\right)\,\operatorname{asin}\left(\sqrt{x}\right)$$

```
[In] int(asin(x^(1/2))/x,x)
[Out] 2*log(1 - exp(asin(x^(1/2))*2i))*asin(x^(1/2)) - asin(x^(1/2))^2*1i - polyl
og(2, exp(asin(x^(1/2))*2i))*1i
```

3.365 $\int \frac{\arcsin(\sqrt{x})}{x^2} \, dx$

Optimal result

Integrand size = 10, antiderivative size = 28

$$\int \frac{\arcsin(\sqrt{x})}{x^2} \, dx = -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{\arcsin(\sqrt{x})}{x}$$

```
[Out] -arcsin(x^(1/2))/x-(1-x)^(1/2)/x^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4926, 12, 37}

$$\int \frac{\arcsin(\sqrt{x})}{x^2} \, dx = -\frac{\arcsin(\sqrt{x})}{x} - \frac{\sqrt{1-x}}{\sqrt{x}}$$

```
[In] Int[ArcSin[Sqrt[x]]/x^2,x]
[Out] -(Sqrt[1 - x]/Sqrt[x]) - ArcSin[Sqrt[x]]/x
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
```

```
1]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\arcsin\left(\sqrt{x}\right)}{x}+\int \frac{1}{2\sqrt{1-x}x^{3/2}}\,dx\\
&= -\frac{\arcsin\left(\sqrt{x}\right)}{x}+\frac{1}{2}\int \frac{1}{\sqrt{1-x}x^{3/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{\sqrt{x}}-\frac{\arcsin\left(\sqrt{x}\right)}{x}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.82

$$
\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx=-\frac{\sqrt{x-x^2}+\arcsin\left(\sqrt{x}\right)}{x}
$$

```
[In] Integrate[ArcSin[Sqrt[x]]/x^2,x]
[Out] -((Sqrt[x - x^2] + ArcSin[Sqrt[x]])/x)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.82

method	result	size
derivativedivides	$-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$	23
default	$-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$	23
parts	$-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$	23

```
[In] int(arcsin(x^(1/2))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -arcsin(x^(1/2))/x-(1-x)^(1/2)/x^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.75

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{x}\sqrt{-x+1} + \arcsin\left(\sqrt{x}\right)}{x}$$

```
[In] integrate(arcsin(x^(1/2))/x^2,x, algorithm="fricas")
[Out] -(sqrt(x)*sqrt(-x + 1) + arcsin(sqrt(x)))/x
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.58 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.50

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = \frac{\begin{cases} -\frac{2i\sqrt{x-1}}{\sqrt{x}} & \text{for } |x| > 1 \\ -\frac{2\sqrt{1-x}}{\sqrt{x}} & \text{otherwise} \end{cases}}{2} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{x}$$

```
[In] integrate(asin(x**(1/2))/x**2,x)
[Out] Piecewise((-2*I*sqrt(x - 1)/sqrt(x), Abs(x) > 1), (-2*sqrt(1 - x)/sqrt(x),
True))/2 - asin(sqrt(x))/x
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.79

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{-x+1}}{\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{x}$$

```
[In] integrate(arcsin(x^(1/2))/x^2,x, algorithm="maxima")
[Out] -sqrt(-x + 1)/sqrt(x) - arcsin(sqrt(x))/x
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.43

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{-x+1}-1}{2\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{x} + \frac{\sqrt{x}}{2\left(\sqrt{-x+1}-1\right)}$$

```
[In] integrate(arcsin(x^(1/2))/x^2,x, algorithm="giac")
[Out] -1/2*(sqrt(-x + 1) - 1)/sqrt(x) - arcsin(sqrt(x))/x + 1/2*sqrt(x)/(sqrt(-x
+ 1) - 1)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^2}\,dx$$

```
[In] int(asin(x^(1/2))/x^2,x)
[Out] int(asin(x^(1/2))/x^2, x)
```

3.366 $\int \frac{\arcsin(\sqrt{x})}{x^3}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 50

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx=-\frac{\sqrt{1-x}}{6x^{3/2}}-\frac{\sqrt{1-x}}{3\sqrt{x}}-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}$$

```
[Out] -1/2*arcsin(x^(1/2))/x^2-1/6*(1-x)^(1/2)/x^(3/2)-1/3*(1-x)^(1/2)/x^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4926, 12, 47, 37}

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx=-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}-\frac{\sqrt{1-x}}{6x^{3/2}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$$

```
[In] Int[ArcSin[Sqrt[x]]/x^3,x]
```

```
[Out] -1/6*Sqrt[1 - x]/x^(3/2) - Sqrt[1 - x]/(3*Sqrt[x]) - ArcSin[Sqrt[x]]/(2*x^2
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
```

```
1]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\arcsin\left(\sqrt{x}\right)}{2x^2} + \frac{1}{2}\int \frac{1}{2\sqrt{1-x}x^{5/2}}\,dx \\
&= -\frac{\arcsin\left(\sqrt{x}\right)}{2x^2} + \frac{1}{4}\int \frac{1}{\sqrt{1-x}x^{5/2}}\,dx \\
&= -\frac{\sqrt{1-x}}{6x^{3/2}} - \frac{\arcsin\left(\sqrt{x}\right)}{2x^2} + \frac{1}{6}\int \frac{1}{\sqrt{1-x}x^{3/2}}\,dx \\
&= -\frac{\sqrt{1-x}}{6x^{3/2}} - \frac{\sqrt{1-x}}{3\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{2x^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.64

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{\sqrt{-((-1+x)x)}(1+2x) + 3\arcsin\left(\sqrt{x}\right)}{6x^2}$$

```
[In] Integrate[ArcSin[Sqrt[x]]/x^3,x]
[Out] -1/6*(Sqrt[-((-1 + x)*x)]*(1 + 2*x) + 3*ArcSin[Sqrt[x]])/x^2
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.70

method	result	size
derivativedivides	$-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$	35
default	$-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$	35
parts	$-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$	35

```
[In] int(arcsin(x^(1/2))/x^3,x,method=_RETURNVERBOSE)
[Out] -1/2*arcsin(x^(1/2))/x^2-1/6*(1-x)^(1/2)/x^(3/2)-1/3*(1-x)^(1/2)/x^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.56

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx=-\frac{(2\,x+1)\sqrt{x}\sqrt{-x+1}+3\,\arcsin\left(\sqrt{x}\right)}{6\,x^2}$$

```
[In] integrate(arcsin(x^(1/2))/x^3,x, algorithm="fricas")
[Out] -1/6*((2*x + 1)*sqrt(x)*sqrt(-x + 1) + 3*arcsin(sqrt(x)))/x^2
```

Sympy [A] (verification not implemented)

Time = 2.73 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.02

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx=\frac{\begin{cases}-\frac{\sqrt{1-x}}{\sqrt{x}}-\frac{(1-x)^{\frac{3}{2}}}{3x^{\frac{3}{2}}} & \text{for } \sqrt{x}>-1\wedge\sqrt{x}<1\end{cases}}{2}-\frac{\operatorname{asin}\left(\sqrt{x}\right)}{2x^2}$$

```
[In] integrate(asin(x**(1/2))/x**3,x)
[Out] Piecewise((-sqrt(1 - x)/sqrt(x) - (1 - x)**(3/2)/(3*x**(3/2)), (sqrt(x) > -
1) & (sqrt(x) < 1)))/2 - asin(sqrt(x))/(2*x**2)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.68

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{\sqrt{-x+1}}{3\sqrt{x}} - \frac{\sqrt{-x+1}}{6\,x^{\frac{3}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{2\,x^2}$$

```
[In] integrate(arcsin(x^(1/2))/x^3,x, algorithm="maxima")
[Out] -1/3*sqrt(-x + 1)/sqrt(x) - 1/6*sqrt(-x + 1)/x^(3/2) - 1/2*arcsin(sqrt(x))/
x^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 74 vs. 2(34) = 68.

Time = 0.28 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.48

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{\left(\sqrt{-x+1}-1\right)^3}{48\,x^{\frac{3}{2}}} - \frac{3\left(\sqrt{-x+1}-1\right)}{16\sqrt{x}} + \frac{x^{\frac{3}{2}}\left(\frac{9\left(\sqrt{-x+1}-1\right)^2}{x}+1\right)}{48\left(\sqrt{-x+1}-1\right)^3} - \frac{\arcsin\left(\sqrt{x}\right)}{2\,x^2}$$

```
[In] integrate(arcsin(x^(1/2))/x^3,x, algorithm="giac")
[Out] -1/48*(sqrt(-x + 1) - 1)^3/x^(3/2) - 3/16*(sqrt(-x + 1) - 1)/sqrt(x) + 1/48
*x^(3/2)*(9*(sqrt(-x + 1) - 1)^2/x + 1)/(sqrt(-x + 1) - 1)^3 - 1/2*arcsin(s
qrt(x))/x^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^3}\,dx$$

```
[In] int(asin(x^(1/2))/x^3,x)
[Out] int(asin(x^(1/2))/x^3, x)
```

3.367 $\int \frac{\arcsin(\sqrt{x})}{x^4} dx$

Optimal result

Integrand size = 10, antiderivative size = 68

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4} dx = -\frac{\sqrt{1-x}}{15x^{5/2}} - \frac{4\sqrt{1-x}}{45x^{3/2}} - \frac{8\sqrt{1-x}}{45\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

```
[Out] -1/3*arcsin(x^(1/2))/x^3-1/15*(1-x)^(1/2)/x^(5/2)-4/45*(1-x)^(1/2)/x^(3/2)-
8/45*(1-x)^(1/2)/x^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4926, 12, 47, 37}

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4} dx = -\frac{\arcsin\left(\sqrt{x}\right)}{3x^3} - \frac{4\sqrt{1-x}}{45x^{3/2}} - \frac{\sqrt{1-x}}{15x^{5/2}} - \frac{8\sqrt{1-x}}{45\sqrt{x}}$$

```
[In] Int[ArcSin[Sqrt[x]]/x^4,x]
```

```
[Out] -1/15*Sqrt[1 - x]/x^(5/2) - (4*Sqrt[1 - x])/(45*x^(3/2)) - (8*Sqrt[1 - x])/
(45*Sqrt[x]) - ArcSin[Sqrt[x]]/(3*x^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}+\frac{1}{3}\int\frac{1}{2\sqrt{1-x}x^{7/2}}\,dx\\
&= -\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}+\frac{1}{6}\int\frac{1}{\sqrt{1-x}x^{7/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{15x^{5/2}}-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}+\frac{2}{15}\int\frac{1}{\sqrt{1-x}x^{5/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{15x^{5/2}}-\frac{4\sqrt{1-x}}{45x^{3/2}}-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}+\frac{4}{45}\int\frac{1}{\sqrt{1-x}x^{3/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{15x^{5/2}}-\frac{4\sqrt{1-x}}{45x^{3/2}}-\frac{8\sqrt{1-x}}{45\sqrt{x}}-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.65

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = 2\left(-\frac{\sqrt{1-x}(3+4x+8x^2)}{90x^{5/2}} - \frac{\arcsin\left(\sqrt{x}\right)}{6x^3}\right)$$

```
[In] Integrate[ArcSin[Sqrt[x]]/x^4,x]
[Out] 2*(-1/90*(Sqrt[1 - x]*(3 + 4*x + 8*x^2))/x^(5/2) - ArcSin[Sqrt[x]]/(6*x^3))
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.69

method	result	size
derivativedivides	$-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3} - \frac{\sqrt{1-x}}{15x^{\frac{5}{2}}} - \frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}} - \frac{8\sqrt{1-x}}{45\sqrt{x}}$	47
default	$-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3} - \frac{\sqrt{1-x}}{15x^{\frac{5}{2}}} - \frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}} - \frac{8\sqrt{1-x}}{45\sqrt{x}}$	47
parts	$-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3} - \frac{\sqrt{1-x}}{15x^{\frac{5}{2}}} - \frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}} - \frac{8\sqrt{1-x}}{45\sqrt{x}}$	47

```
[In] int(arcsin(x^(1/2))/x^4,x,method=_RETURNVERBOSE)
[Out] -1/3*arcsin(x^(1/2))/x^3-1/15*(1-x)^(1/2)/x^(5/2)-4/45*(1-x)^(1/2)/x^(3/2)-
8/45*(1-x)^(1/2)/x^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.49

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{(8\,x^2+4\,x+3)\sqrt{x}\sqrt{-x+1}+15\,\arcsin\left(\sqrt{x}\right)}{45\,x^3}$$

```
[In] integrate(arcsin(x^(1/2))/x^4,x, algorithm="fricas")
[Out] -1/45*((8*x^2 + 4*x + 3)*sqrt(x)*sqrt(-x + 1) + 15*arcsin(sqrt(x)))/x^3
```

Sympy [A] (verification not implemented)

Time = 8.50 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.97

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = \frac{\begin{cases} -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{2(1-x)^{\frac{3}{2}}}{3x^{\frac{3}{2}}} - \frac{(1-x)^{\frac{5}{2}}}{5x^{\frac{5}{2}}} & \text{for}\ \sqrt{x} > -1 \wedge \sqrt{x} < 1 \end{cases}}{3} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{3x^3}$$

```
[In] integrate(asin(x**(1/2))/x**4,x)
```

```
[Out] Piecewise((-sqrt(1 - x)/sqrt(x) - 2*(1 - x)**(3/2)/(3*x**(3/2)) - (1 - x)**
(5/2)/(5*x**(5/2)), (sqrt(x) > -1) & (sqrt(x) < 1)))/3 - asin(sqrt(x))/(3*x
**3)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.68

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{8\sqrt{-x+1}}{45\sqrt{x}} - \frac{4\sqrt{-x+1}}{45\,x^{\frac{3}{2}}} - \frac{\sqrt{-x+1}}{15\,x^{\frac{5}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{3\,x^3}$$

```
[In] integrate(arcsin(x^(1/2))/x^4,x, algorithm="maxima")
```

```
[Out] -8/45*sqrt(-x + 1)/sqrt(x) - 4/45*sqrt(-x + 1)/x^(3/2) - 1/15*sqrt(-x + 1)/
x^(5/2) - 1/3*arcsin(sqrt(x))/x^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 106 vs. 2(46) = 92.

Time = 0.28 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.56

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{\left(\sqrt{-x+1}-1\right)^5}{480\,x^{\frac{5}{2}}} - \frac{5\left(\sqrt{-x+1}-1\right)^3}{288\,x^{\frac{3}{2}}} - \frac{5\left(\sqrt{-x+1}-1\right)}{48\sqrt{x}} + \frac{\left(\frac{150\left(\sqrt{-x+1}-1\right)^4}{x^2} + \frac{25\left(\sqrt{-x+1}-1\right)^2}{x} + 3\right)x^{\frac{5}{2}}}{1440\left(\sqrt{-x+1}-1\right)^5} - \frac{\arcsin\left(\sqrt{x}\right)}{3\,x^3}$$

```
[In] integrate(arcsin(x^(1/2))/x^4,x, algorithm="giac")
```

```
[Out] -1/480*(sqrt(-x + 1) - 1)^5/x^(5/2) - 5/288*(sqrt(-x + 1) - 1)^3/x^(3/2) -
5/48*(sqrt(-x + 1) - 1)/sqrt(x) + 1/1440*(150*(sqrt(-x + 1) - 1)^4/x^2 + 25
*(sqrt(-x + 1) - 1)^2/x + 3)*x^(5/2)/(sqrt(-x + 1) - 1)^5 - 1/3*arcsin(sqrt
(x))/x^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^4}\,dx$$

```
[In] int(asin(x^(1/2))/x^4,x)
[Out] int(asin(x^(1/2))/x^4, x)
```

3.368 $\int \frac{\arcsin(\sqrt{x})}{x^5} \, dx$

Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5} \, dx = -\frac{\sqrt{1-x}}{28x^{7/2}} - \frac{3\sqrt{1-x}}{70x^{5/2}} - \frac{2\sqrt{1-x}}{35x^{3/2}} - \frac{4\sqrt{1-x}}{35\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

```
[Out] -1/4*arcsin(x^(1/2))/x^4-1/28*(1-x)^(1/2)/x^(7/2)-3/70*(1-x)^(1/2)/x^(5/2)-
2/35*(1-x)^(1/2)/x^(3/2)-4/35*(1-x)^(1/2)/x^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4926, 12, 47, 37}

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5} \, dx = -\frac{\arcsin\left(\sqrt{x}\right)}{4x^4} - \frac{2\sqrt{1-x}}{35x^{3/2}} - \frac{3\sqrt{1-x}}{70x^{5/2}} - \frac{\sqrt{1-x}}{28x^{7/2}} - \frac{4\sqrt{1-x}}{35\sqrt{x}}$$

```
[In] Int[ArcSin[Sqrt[x]]/x^5,x]
```

```
[Out] -1/28*Sqrt[1 - x]/x^(7/2) - (3*Sqrt[1 - x])/(70*x^(5/2)) - (2*Sqrt[1 - x])/
(35*x^(3/2)) - (4*Sqrt[1 - x])/(35*Sqrt[x]) - ArcSin[Sqrt[x]]/(4*x^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}+\frac{1}{4}\int\frac{1}{2\sqrt{1-x}x^{9/2}}\,dx\\
&= -\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}+\frac{1}{8}\int\frac{1}{\sqrt{1-x}x^{9/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{28x^{7/2}}-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}+\frac{3}{28}\int\frac{1}{\sqrt{1-x}x^{7/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{28x^{7/2}}-\frac{3\sqrt{1-x}}{70x^{5/2}}-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}+\frac{3}{35}\int\frac{1}{\sqrt{1-x}x^{5/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{28x^{7/2}}-\frac{3\sqrt{1-x}}{70x^{5/2}}-\frac{2\sqrt{1-x}}{35x^{3/2}}-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}+\frac{2}{35}\int\frac{1}{\sqrt{1-x}x^{3/2}}\,dx\\
&= -\frac{\sqrt{1-x}}{28x^{7/2}}-\frac{3\sqrt{1-x}}{70x^{5/2}}-\frac{2\sqrt{1-x}}{35x^{3/2}}-\frac{4\sqrt{1-x}}{35\sqrt{x}}-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.57

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = 2\left(-\frac{\sqrt{1-x}(5+6x+8x^2+16x^3)}{280x^{7/2}} - \frac{\arcsin\left(\sqrt{x}\right)}{8x^4}\right)$$

```
[In] Integrate[ArcSin[Sqrt[x]]/x^5,x]
[Out] 2*(-1/280*(Sqrt[1 - x]*(5 + 6*x + 8*x^2 + 16*x^3))/x^(7/2) - ArcSin[Sqrt[x]
]/(8*x^4))
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.69

method	result	size
derivativedivides	$-\frac{\arcsin(\sqrt{x})}{4x^4} - \frac{\sqrt{1-x}}{28x^{\frac{7}{2}}} - \frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}} - \frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}} - \frac{4\sqrt{1-x}}{35\sqrt{x}}$	59
default	$-\frac{\arcsin(\sqrt{x})}{4x^4} - \frac{\sqrt{1-x}}{28x^{\frac{7}{2}}} - \frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}} - \frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}} - \frac{4\sqrt{1-x}}{35\sqrt{x}}$	59
parts	$-\frac{\arcsin(\sqrt{x})}{4x^4} - \frac{\sqrt{1-x}}{28x^{\frac{7}{2}}} - \frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}} - \frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}} - \frac{4\sqrt{1-x}}{35\sqrt{x}}$	59

```
[In] int(arcsin(x^(1/2))/x^5,x,method=_RETURNVERBOSE)
[Out] -1/4*arcsin(x^(1/2))/x^4-1/28*(1-x)^(1/2)/x^(7/2)-3/70*(1-x)^(1/2)/x^(5/2)-
2/35*(1-x)^(1/2)/x^(3/2)-4/35*(1-x)^(1/2)/x^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.44

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = -\frac{(16\,x^3+8\,x^2+6\,x+5)\sqrt{x}\sqrt{-x+1}+35\,\arcsin\left(\sqrt{x}\right)}{140\,x^4}$$

```
[In] integrate(arcsin(x^(1/2))/x^5,x, algorithm="fricas")
[Out] -1/140*((16*x^3 + 8*x^2 + 6*x + 5)*sqrt(x)*sqrt(-x + 1) + 35*arcsin(sqrt(x)
))/x^4
```

Sympy [A] (verification not implemented)

Time = 25.75 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.91

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = \frac{\begin{cases} -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{(1-x)^{\frac{3}{2}}}{x^{\frac{3}{2}}} - \frac{3(1-x)^{\frac{5}{2}}}{5x^{\frac{5}{2}}} - \frac{(1-x)^{\frac{7}{2}}}{7x^{\frac{7}{2}}} & \text{for } \sqrt{x} > -1 \wedge \sqrt{x} < 1 \end{cases}}{4} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{4x^4}$$

```
[In] integrate(asin(x**(1/2))/x**5,x)
[Out] Piecewise((-sqrt(1 - x)/sqrt(x) - (1 - x)**(3/2)/x**(3/2) - 3*(1 - x)**(5/2
)/(5*x**(5/2)) - (1 - x)**(7/2)/(7*x**(7/2)), (sqrt(x) > -1) & (sqrt(x) < 1
)))/4 - asin(sqrt(x))/(4*x**4)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = -\frac{4\sqrt{-x+1}}{35\sqrt{x}} - \frac{2\sqrt{-x+1}}{35\,x^{\frac{3}{2}}} - \frac{3\sqrt{-x+1}}{70\,x^{\frac{5}{2}}} - \frac{\sqrt{-x+1}}{28\,x^{\frac{7}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{4\,x^4}$$

```
[In] integrate(arcsin(x^(1/2))/x^5,x, algorithm="maxima")
[Out] -4/35*sqrt(-x + 1)/sqrt(x) - 2/35*sqrt(-x + 1)/x^(3/2) - 3/70*sqrt(-x + 1)/
x^(5/2) - 1/28*sqrt(-x + 1)/x^(7/2) - 1/4*arcsin(sqrt(x))/x^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 138 vs. 2(58) = 116.

Time = 0.27 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.60

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = -\frac{\left(\sqrt{-x+1}-1\right)^7}{3584\,x^{\frac{7}{2}}} - \frac{7\left(\sqrt{-x+1}-1\right)^5}{2560\,x^{\frac{5}{2}}} - \frac{7\left(\sqrt{-x+1}-1\right)^3}{512\,x^{\frac{3}{2}}} - \frac{35\left(\sqrt{-x+1}-1\right)}{512\sqrt{x}} + \frac{\left(\frac{1225\left(\sqrt{-x+1}-1\right)^6}{x^3} + \frac{245\left(\sqrt{-x+1}-1\right)^4}{x^2} + \frac{49\left(\sqrt{-x+1}-1\right)^2}{x} + 5\right)x^{\frac{7}{2}}}{17920\left(\sqrt{-x+1}-1\right)^7} - \frac{\arcsin\left(\sqrt{x}\right)}{4\,x^4}$$

```
[In] integrate(arcsin(x^(1/2))/x^5,x, algorithm="giac")
```

```
[Out] -1/3584*(sqrt(-x + 1) - 1)^7/x^(7/2) - 7/2560*(sqrt(-x + 1) - 1)^5/x^(5/2)
- 7/512*(sqrt(-x + 1) - 1)^3/x^(3/2) - 35/512*(sqrt(-x + 1) - 1)/sqrt(x) +
1/17920*(1225*(sqrt(-x + 1) - 1)^6/x^3 + 245*(sqrt(-x + 1) - 1)^4/x^2 + 49*
(sqrt(-x + 1) - 1)^2/x + 5)*x^(7/2)/(sqrt(-x + 1) - 1)^7 - 1/4*arcsin(sqrt(
x))/x^4
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^5}\,dx$$

```
[In] int(asin(x^(1/2))/x^5,x)
```

```
[Out] int(asin(x^(1/2))/x^5, x)
```

3.369 $\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$

Optimal result

Integrand size = 14, antiderivative size = 89

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{3}{40}bc^3\sqrt{1-\frac{c^2}{x^2}}x^2+\frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4+\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{3}{40}bc^5\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

```
[Out] 1/5*x^5*(a+b*arcsin(c/x))+3/40*b*c^5*arctanh((1-c^2/x^2)^(1/2))+3/40*b*c^3*
x^2*(1-c^2/x^2)^(1/2)+1/20*b*c*x^4*(1-c^2/x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4926, 12, 272, 44, 65, 214}

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{3}{40}bc^5\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)+\frac{1}{20}bcx^4\sqrt{1-\frac{c^2}{x^2}}+\frac{3}{40}bc^3x^2\sqrt{1-\frac{c^2}{x^2}}$$

```
[In] Int[x^4*(a + b*ArcSin[c/x]),x]
```

```
[Out] (3*b*c^3*Sqrt[1 - c^2/x^2]*x^2)/40 + (b*c*Sqrt[1 - c^2/x^2]*x^4)/20 + (x^5*
(a + b*ArcSin[c/x]))/5 + (3*b*c^5*ArcTanh[Sqrt[1 - c^2/x^2]])/40
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{5}b\int\frac{cx^3}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{5}(bc)\int\frac{x^3}{\sqrt{1-\frac{c^2}{x^2}}}\,dx
\end{aligned}
$$

$$= \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{10}(bc)\text{Subst}\left(\int \frac{1}{x^3\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)$$

$$= \frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4 + \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{40}(3bc^3)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)$$

$$= \frac{3}{40}bc^3\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4 + \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{80}(3bc^5)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)$$

$$= \frac{3}{40}bc^3\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4 + \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right) + \frac{1}{40}(3bc^3)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-\frac{c^2}{x^2}}\right)$$

$$= \frac{3}{40}bc^3\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4 + \frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right) + \frac{3}{40}bc^5\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.02

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{ax^5}{5} + b\sqrt{\frac{-c^2+x^2}{x^2}}\left(\frac{3c^3x^2}{40} + \frac{cx^4}{20}\right) + \frac{1}{5}bx^5\arcsin\left(\frac{c}{x}\right) + \frac{3}{40}bc^5\log\left(x\left(1+\sqrt{\frac{-c^2+x^2}{x^2}}\right)\right)$$

```
[In] Integrate[x^4*(a + b*ArcSin[c/x]),x]
```

```
[Out] (a*x^5)/5 + b*Sqrt[(-c^2 + x^2)/x^2]*((3*c^3*x^2)/40 + (c*x^4)/20) + (b*x^5
*ArcSin[c/x])/5 + (3*b*c^5*Log[x*(1 + Sqrt[(-c^2 + x^2)/x^2])])/40
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.94

method	result	size
parts	$\frac{a x^{5}}{5}-b c^{5}\left(-\frac{x^{5} \arcsin\left(\frac{c}{x}\right)}{5 c^{5}}-\frac{x^{4} \sqrt{1-\frac{c^{2}}{x^{2}}}}{20 c^{4}}-\frac{3 x^{2} \sqrt{1-\frac{c^{2}}{x^{2}}}}{40 c^{2}}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)$	84
derivativedivides	$-c^{5}\left(-\frac{a x^{5}}{5 c^{5}}+b\left(-\frac{x^{5} \arcsin\left(\frac{c}{x}\right)}{5 c^{5}}-\frac{x^{4} \sqrt{1-\frac{c^{2}}{x^{2}}}}{20 c^{4}}-\frac{3 x^{2} \sqrt{1-\frac{c^{2}}{x^{2}}}}{40 c^{2}}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)\right)$	88
default	$-c^{5}\left(-\frac{a x^{5}}{5 c^{5}}+b\left(-\frac{x^{5} \arcsin\left(\frac{c}{x}\right)}{5 c^{5}}-\frac{x^{4} \sqrt{1-\frac{c^{2}}{x^{2}}}}{20 c^{4}}-\frac{3 x^{2} \sqrt{1-\frac{c^{2}}{x^{2}}}}{40 c^{2}}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)\right)$	88

```
[In] int(x^4*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*a*x^5-b*c^5*(-1/5/c^5*x^5*arcsin(c/x)-1/20/c^4*x^4*(1-c^2/x^2)^(1/2)-3/
40/c^2*x^2*(1-c^2/x^2)^(1/2)-3/40*arctanh(1/(1-c^2/x^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.33

$$\int x^{4}\left(a+b \arcsin\left(\frac{c}{x}\right)\right)\,dx=-\frac{3}{40}\,bc^{5}\log\left(x\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}-x\right)+\frac{1}{5}\,ax^{5}+\frac{1}{5}\left(bx^{5}-b\right)\arcsin\left(\frac{c}{x}\right)-\frac{2}{5}\,b\arctan\left(\frac{x\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}-x}{c}\right)+\frac{1}{40}\left(3\,bc^{3}x^{2}+2\,bcx^{4}\right)\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}$$

```
[In] integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="fricas")
```

```
[Out] -3/40*b*c^5*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + 1/5*a*x^5 + 1/5*(b*x^5 - b)
*arcsin(c/x) - 2/5*b*arctan((x*sqrt(-(c^2 - x^2)/x^2) - x)/c) + 1/40*(3*b*c
^3*x^2 + 2*b*c*x^4)*sqrt(-(c^2 - x^2)/x^2)
```

Sympy [A] (verification not implemented)

Time = 3.73 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.97

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{ax^5}{5} + \frac{bc\left(\begin{cases}\frac{3c^4\operatorname{acosh}\left(\frac{x}{c}\right)}{8} - \frac{3c^3x}{8\sqrt{-1+\frac{x^2}{c^2}}} + \frac{cx^3}{8\sqrt{-1+\frac{x^2}{c^2}}} + \frac{x^5}{4c\sqrt{-1+\frac{x^2}{c^2}}} & \text{for } \left|\frac{x^2}{c^2}\right| > 1 \\ -\frac{3ic^4\operatorname{asin}\left(\frac{x}{c}\right)}{8} + \frac{3ic^3x}{8\sqrt{1-\frac{x^2}{c^2}}} - \frac{icx^3}{8\sqrt{1-\frac{x^2}{c^2}}} - \frac{ix^5}{4c\sqrt{1-\frac{x^2}{c^2}}} & \text{otherwise}\end{cases}\right)}{5} + \frac{bx^5\operatorname{asin}\left(\frac{c}{x}\right)}{5}$$

```
[In] integrate(x**4*(a+b*asin(c/x)),x)
```

```
[Out] a*x**5/5 + b*c*Piecewise((3*c**4*acosh(x/c)/8 - 3*c**3*x/(8*sqrt(-1 + x**2/
c**2)) + c*x**3/(8*sqrt(-1 + x**2/c**2)) + x**5/(4*c*sqrt(-1 + x**2/c**2)),
 Abs(x**2/c**2) > 1), (-3*I*c**4*asin(x/c)/8 + 3*I*c**3*x/(8*sqrt(1 - x**2/
c**2)) - I*c*x**3/(8*sqrt(1 - x**2/c**2)) - I*x**5/(4*c*sqrt(1 - x**2/c**2)
), True))/5 + b*x**5*asin(c/x)/5
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.40

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{1}{5}\,ax^5 + \frac{1}{80}\left(16\,x^5\arcsin\left(\frac{c}{x}\right) + \left(3\,c^4\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right) - 3\,c^4\log\left(\sqrt{-\frac{c^2}{x^2}+1}-1\right) - \frac{2\left(3\,c^4\left(-\frac{c^2}{x^2}+1\right)\right.}{\left(\frac{c^2}{x^2}-1\right.}\right.\right.$$

```
[In] integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5 + 1/80*(16*x^5*arcsin(c/x) + (3*c^4*log(sqrt(-c^2/x^2 + 1) + 1) -
 3*c^4*log(sqrt(-c^2/x^2 + 1) - 1) - 2*(3*c^4*(-c^2/x^2 + 1)^(3/2) - 5*c^4*
sqrt(-c^2/x^2 + 1))/((c^2/x^2 - 1)^2 + 2*c^2/x^2 - 1))*c)*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 464 vs. 2(75) = 150.

Time = 1.01 (sec) , antiderivative size = 464, normalized size of antiderivative = 5.21

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{2\,bcx^5\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^5\arcsin\left(\frac{c}{x}\right)+2\,acx^5\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^5+bc^2x^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4+10\,bc^3x^3\left(\sqrt{\cdots}\right.}{\cdots}$$

```
[In] integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="giac")
```

```
[Out] 1/320*(2*b*c*x^5*(sqrt(-c^2/x^2 + 1) + 1)^5*arcsin(c/x) + 2*a*c*x^5*(sqrt(-
c^2/x^2 + 1) + 1)^5 + b*c^2*x^4*(sqrt(-c^2/x^2 + 1) + 1)^4 + 10*b*c^3*x^3*(
sqrt(-c^2/x^2 + 1) + 1)^3*arcsin(c/x) + 10*a*c^3*x^3*(sqrt(-c^2/x^2 + 1) +
1)^3 + 8*b*c^4*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2 + 20*b*c^5*x*(sqrt(-c^2/x^2 +
 1) + 1)*arcsin(c/x) + 20*a*c^5*x*(sqrt(-c^2/x^2 + 1) + 1) + 24*b*c^6*log(s
qrt(-c^2/x^2 + 1) + 1) - 24*b*c^6*log(abs(c)/abs(x)) + 20*b*c^7*arcsin(c/x)
/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 20*a*c^7/(x*(sqrt(-c^2/x^2 + 1) + 1)) - 8*b
*c^8/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2) + 10*b*c^9*arcsin(c/x)/(x^3*(sqrt(-c^
2/x^2 + 1) + 1)^3) + 10*a*c^9/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3) - b*c^10/(x^
4*(sqrt(-c^2/x^2 + 1) + 1)^4) + 2*b*c^11*arcsin(c/x)/(x^5*(sqrt(-c^2/x^2 +
1) + 1)^5) + 2*a*c^11/(x^5*(sqrt(-c^2/x^2 + 1) + 1)^5))/c
```

Mupad [F(-1)]

Timed out.

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^4\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

```
[In] int(x^4*(a + b*asin(c/x)),x)
```

```
[Out] int(x^4*(a + b*asin(c/x)), x)
```

3.370 $\int x^3 \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx$

Optimal result

Integrand size = 14, antiderivative size = 64

$$\int x^3 \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx=\frac{1}{6}bc^3\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{12}bc\sqrt{1-\frac{c^2}{x^2}}x^3+\frac{1}{4}x^4\left(a+b \arcsin \left(\frac{c}{x}\right)\right)$$

```
[Out] 1/4*x^4*(a+b*arcsin(c/x))+1/6*b*c^3*x*(1-c^2/x^2)^(1/2)+1/12*b*c*x^3*(1-c^2
/x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 277, 197}

$$\int x^3 \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx=\frac{1}{4}x^4\left(a+b \arcsin \left(\frac{c}{x}\right)\right)+\frac{1}{12}bcx^3\sqrt{1-\frac{c^2}{x^2}}+\frac{1}{6}bc^3x\sqrt{1-\frac{c^2}{x^2}}$$

```
[In] Int[x^3*(a + b*ArcSin[c/x]),x]
```

```
[Out] (b*c^3*Sqrt[1 - c^2/x^2]*x)/6 + (b*c*Sqrt[1 - c^2/x^2]*x^3)/12 + (x^4*(a +
b*ArcSin[c/x]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{4}b\int\frac{cx^2}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{4}x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{4}(bc)\int\frac{x^2}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{12}bc\sqrt{1-\frac{c^2}{x^2}}x^3+\frac{1}{4}x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{6}\left(bc^3\right)\int\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{6}bc^3\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{12}bc\sqrt{1-\frac{c^2}{x^2}}x^3+\frac{1}{4}x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.92

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^4}{4}+b\sqrt{\frac{-c^2+x^2}{x^2}}\left(\frac{c^3x}{6}+\frac{cx^3}{12}\right)+\frac{1}{4}bx^4\arcsin\left(\frac{c}{x}\right)$$

```
[In] Integrate[x^3*(a + b*ArcSin[c/x]),x]
[Out] (a*x^4)/4 + b*Sqrt[(-c^2 + x^2)/x^2]*((c^3*x)/6 + (c*x^3)/12) + (b*x^4*ArcS
in[c/x])/4
```

Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.05

method	result	size
parts	$\frac{a\,x^{4}}{4}-b\,c^{4}\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)$	67
derivativedivides	$-c^{4}\left(-\frac{a\,x^{4}}{4c^{4}}+b\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)\right)$	71
default	$-c^{4}\left(-\frac{a\,x^{4}}{4c^{4}}+b\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)\right)$	71

```
[In] int(x^3*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
[Out] 1/4*a*x^4-b*c^4*(-1/4/c^4*x^4*arcsin(c/x)-1/12/c^3*x^3*(1-c^2/x^2)^(1/2)-1/
6/c*x*(1-c^2/x^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.80

$$\int x^{3}\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{4}\,bx^{4}\arcsin\left(\frac{c}{x}\right)+\frac{1}{4}\,ax^{4}+\frac{1}{12}\,\left(2\,bc^{3}x+bcx^{3}\right)\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}$$

```
[In] integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="fricas")
[Out] 1/4*b*x^4*arcsin(c/x) + 1/4*a*x^4 + 1/12*(2*b*c^3*x + b*c*x^3)*sqrt(-(c^2 -
 x^2)/x^2)
```

Sympy [A] (verification not implemented)

Time = 1.43 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.67

$$\int x^{3}\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^{4}}{4}+\frac{bc\left(\begin{cases}\frac{2c^{3}\sqrt{-1+\frac{x^{2}}{c^{2}}}}{3}+\frac{cx^{2}\sqrt{-1+\frac{x^{2}}{c^{2}}}}{3} & \text{for}\ \left|\frac{x^{2}}{c^{2}}\right|>1\\ \frac{2ic^{3}\sqrt{1-\frac{x^{2}}{c^{2}}}}{3}+\frac{icx^{2}\sqrt{1-\frac{x^{2}}{c^{2}}}}{3} & \text{otherwise}\end{cases}\right)}{4}+\frac{bx^{4}\operatorname{asin}\left(\frac{c}{x}\right)}{4}$$

```
[In] integrate(x**3*(a+b*asin(c/x)),x)
```

```
[Out] a*x**4/4 + b*c*Piecewise((2*c**3*sqrt(-1 + x**2/c**2)/3 + c*x**2*sqrt(-1 +
x**2/c**2)/3, Abs(x**2/c**2) > 1), (2*I*c**3*sqrt(1 - x**2/c**2)/3 + I*c*x*
*2*sqrt(1 - x**2/c**2)/3, True))/4 + b*x**4*asin(c/x)/4
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.92

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{1}{4}ax^4+\frac{1}{12}\left(3\,x^4\arcsin\left(\frac{c}{x}\right)+\left(x^3\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}+3\,c^2x\sqrt{-\frac{c^2}{x^2}+1}\right)c\right)b$$

```
[In] integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4 + 1/12*(3*x^4*arcsin(c/x) + (x^3*(-c^2/x^2 + 1)^(3/2) + 3*c^2*x*s
qrt(-c^2/x^2 + 1))*c)*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 340 vs. 2(54) = 108.

Time = 0.29 (sec) , antiderivative size = 340, normalized size of antiderivative = 5.31

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{3\,bcx^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4\arcsin\left(\frac{c}{x}\right)+3\,acx^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4+2\,bc^2x^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3+12\,bc^3x^2\left(\right.}{}$$

```
[In] integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="giac")
```

```
[Out] 1/192*(3*b*c*x^4*(sqrt(-c^2/x^2 + 1) + 1)^4*arcsin(c/x) + 3*a*c*x^4*(sqrt(-
c^2/x^2 + 1) + 1)^4 + 2*b*c^2*x^3*(sqrt(-c^2/x^2 + 1) + 1)^3 + 12*b*c^3*x^2
*(sqrt(-c^2/x^2 + 1) + 1)^2*arcsin(c/x) + 12*a*c^3*x^2*(sqrt(-c^2/x^2 + 1)
+ 1)^2 + 18*b*c^4*x*(sqrt(-c^2/x^2 + 1) + 1) + 18*b*c^5*arcsin(c/x) + 18*a*
c^5 - 18*b*c^6/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 12*b*c^7*arcsin(c/x)/(x^2*(sq
rt(-c^2/x^2 + 1) + 1)^2) + 12*a*c^7/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2) - 2*b*
c^8/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3) + 3*b*c^9*arcsin(c/x)/(x^4*(sqrt(-c^2/
x^2 + 1) + 1)^4) + 3*a*c^9/(x^4*(sqrt(-c^2/x^2 + 1) + 1)^4))/c
```

Mupad [F(-1)]

Timed out.

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^3\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

```
[In] int(x^3*(a + b*asin(c/x)),x)
[Out] int(x^3*(a + b*asin(c/x)), x)
```

3.371 $\int x^2 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) \, dx$

Optimal result

Integrand size = 14, antiderivative size = 64

$$\int x^2 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) \, dx = \frac{1}{6} b c \sqrt{1 - \frac{c^2}{x^2}} x^2 + \frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) + \frac{1}{6} b c^3 \operatorname{arctanh}\left(\sqrt{1 - \frac{c^2}{x^2}}\right)$$

```
[Out] 1/3*x^3*(a+b*arcsin(c/x))+1/6*b*c^3*arctanh((1-c^2/x^2)^(1/2))+1/6*b*c*x^2*
(1-c^2/x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4926, 12, 272, 44, 65, 214}

$$\int x^2 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) \, dx = \frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) + \frac{1}{6} b c^3 \operatorname{arctanh}\left(\sqrt{1 - \frac{c^2}{x^2}}\right) + \frac{1}{6} b c x^2 \sqrt{1 - \frac{c^2}{x^2}}$$

```
[In] Int[x^2*(a + b*ArcSin[c/x]),x]
```

```
[Out] (b*c*Sqrt[1 - c^2/x^2]*x^2)/6 + (x^3*(a + b*ArcSin[c/x]))/3 + (b*c^3*ArcTan
h[Sqrt[1 - c^2/x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\text{integral} = \frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{3}b\int\frac{cx}{\sqrt{1-\frac{c^2}{x^2}}}\,dx$$

$$=\frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{3}(bc)\int\frac{x}{\sqrt{1-\frac{c^2}{x^2}}}\,dx$$

$$= \frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{6}(bc)\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)$$

$$= \frac{1}{6}bc\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{12}\left(bc^3\right)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)$$

$$= \frac{1}{6}bc\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right) + \frac{1}{6}(bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-\frac{c^2}{x^2}}\right)$$

$$= \frac{1}{6}bc\sqrt{1-\frac{c^2}{x^2}}x^2 + \frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right) + \frac{1}{6}bc^3\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.23

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{ax^3}{3} + \frac{1}{6}bcx^2\sqrt{\frac{-c^2+x^2}{x^2}} + \frac{1}{3}bx^3\arcsin\left(\frac{c}{x}\right) + \frac{1}{6}bc^3\log\left(x\left(1+\sqrt{\frac{-c^2+x^2}{x^2}}\right)\right)$$

```
[In] Integrate[x^2*(a + b*ArcSin[c/x]),x]
[Out] (a*x^3)/3 + (b*c*x^2*Sqrt[(-c^2 + x^2)/x^2])/6 + (b*x^3*ArcSin[c/x])/3 + (b
*c^3*Log[x*(1 + Sqrt[(-c^2 + x^2)/x^2])])/6
```

Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00

method	result	size
parts	$\frac{x^3 a}{3}-b\,c^3\left(-\frac{x^3 \arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)$	64
derivativedivides	$-c^3\left(-\frac{a\,x^3}{3c^3}+b\left(-\frac{x^3 \arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)\right)$	68
default	$-c^3\left(-\frac{a\,x^3}{3c^3}+b\left(-\frac{x^3 \arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)\right)$	68

```
[In] int(x^2*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
[Out] 1/3*x^3*a-b*c^3*(-1/3/c^3*x^3*arcsin(c/x)-1/6/c^2*x^2*(1-c^2/x^2)^(1/2)-1/6
*arctanh(1/(1-c^2/x^2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.66

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=-\frac{1}{6}\,bc^3\log\left(x\sqrt{-\frac{c^2-x^2}{x^2}}-x\right)+\frac{1}{6}\,bcx^2\sqrt{-\frac{c^2-x^2}{x^2}}+\frac{1}{3}\,ax^3+\frac{1}{3}\left(bx^3-b\right)\arcsin\left(\frac{c}{x}\right)-\frac{2}{3}\,b\arctan\left(\frac{x\sqrt{-\frac{c^2-x^2}{x^2}}-x}{c}\right)$$

```
[In] integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="fricas")
[Out] -1/6*b*c^3*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + 1/6*b*c*x^2*sqrt(-(c^2 - x^2
)/x^2) + 1/3*a*x^3 + 1/3*(b*x^3 - b)*arcsin(c/x) - 2/3*b*arctan((x*sqrt(-(c
^2 - x^2)/x^2) - x)/c)
```

Sympy [A] (verification not implemented)

Time = 1.96 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.64

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^3}{3}+\frac{bc\left(\begin{cases}\frac{c^2\operatorname{acosh}\left(\frac{x}{c}\right)}{2}-\frac{cx}{2\sqrt{-1+\frac{x^2}{c^2}}}+\frac{x^3}{2c\sqrt{-1+\frac{x^2}{c^2}}} & \text{for } \left|\frac{x^2}{c^2}\right|>1\\ -\frac{ic^2\operatorname{asin}\left(\frac{x}{c}\right)}{2}+\frac{icx\sqrt{1-\frac{x^2}{c^2}}}{2} & \text{otherwise}\end{cases}\right)}{3}+\frac{bx^3\operatorname{asin}\left(\frac{c}{x}\right)}{3}$$

```
[In] integrate(x**2*(a+b*asin(c/x)),x)
[Out] a*x**3/3 + b*c*Piecewise((c**2*acosh(x/c)/2 - c*x/(2*sqrt(-1 + x**2/c**2))
+ x**3/(2*c*sqrt(-1 + x**2/c**2)), Abs(x**2/c**2) > 1), (-I*c**2*asin(x/c)/
2 + I*c*x*sqrt(1 - x**2/c**2)/2, True))/3 + b*x**3*asin(c/x)/3
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.27

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{3}ax^3+\frac{1}{12}\left(4x^3\arcsin\left(\frac{c}{x}\right)+\left(c^2\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-c^2\log\left(\sqrt{-\frac{c^2}{x^2}+1}-1\right)+2x^2\sqrt{-\frac{c^2}{x^2}+1}\right)c\right)b$$

```
[In] integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="maxima")
[Out] 1/3*a*x^3 + 1/12*(4*x^3*arcsin(c/x) + (c^2*log(sqrt(-c^2/x^2 + 1) + 1) - c^
2*log(sqrt(-c^2/x^2 + 1) - 1) + 2*x^2*sqrt(-c^2/x^2 + 1))*c)*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 298 vs. 2(54) = 108.

Time = 0.49 (sec) , antiderivative size = 298, normalized size of antiderivative = 4.66

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{bcx^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3\arcsin\left(\frac{c}{x}\right)+acx^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3+bc^2x^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2+3bc^3x\left(\sqrt{-\frac{c^2}{x^2}\right.}{}$$

```
[In] integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="giac")
```

```
[Out] 1/24*(b*c*x^3*(sqrt(-c^2/x^2 + 1) + 1)^3*arcsin(c/x) + a*c*x^3*(sqrt(-c^2/x
^2 + 1) + 1)^3 + b*c^2*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2 + 3*b*c^3*x*(sqrt(-c^
2/x^2 + 1) + 1)*arcsin(c/x) + 3*a*c^3*x*(sqrt(-c^2/x^2 + 1) + 1) + 4*b*c^4*
log(sqrt(-c^2/x^2 + 1) + 1) - 4*b*c^4*log(abs(c)/abs(x)) + 3*b*c^5*arcsin(c
/x)/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 3*a*c^5/(x*(sqrt(-c^2/x^2 + 1) + 1)) - b
*c^6/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2) + b*c^7*arcsin(c/x)/(x^3*(sqrt(-c^2/x
^2 + 1) + 1)^3) + a*c^7/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3))/c
```

Mupad [F(-1)]

Timed out.

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^2\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

```
[In] int(x^2*(a + b*asin(c/x)),x)
```

```
[Out] int(x^2*(a + b*asin(c/x)), x)
```

3.372 $\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$

Optimal result

Integrand size = 12, antiderivative size = 39

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}bc\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

```
[Out] 1/2*x^2*(a+b*arcsin(c/x))+1/2*b*c*x*(1-c^2/x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4926, 12, 197}

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{2}bcx\sqrt{1-\frac{c^2}{x^2}}$$

```
[In] Int[x*(a + b*ArcSin[c/x]),x]
```

```
[Out] (b*c*Sqrt[1 - c^2/x^2]*x)/2 + (x^2*(a + b*ArcSin[c/x]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{2}b\int\frac{c}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{2}(bc)\int\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\,dx\\
&= \frac{1}{2}bc\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.21

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^2}{2}+\frac{1}{2}bcx\sqrt{\frac{-c^2+x^2}{x^2}}+\frac{1}{2}bx^2\arcsin\left(\frac{c}{x}\right)$$

```
[In] Integrate[x*(a + b*ArcSin[c/x]),x]
[Out] (a*x^2)/2 + (b*c*x*Sqrt[(-c^2 + x^2)/x^2])/2 + (b*x^2*ArcSin[c/x])/2
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.21

method	result	size
parts	$\frac{a\,x^2}{2}-b\,c^2\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)$	47
derivativedivides	$-c^2\left(-\frac{a\,x^2}{2c^2}+b\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)\right)$	51
default	$-c^2\left(-\frac{a\,x^2}{2c^2}+b\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)\right)$	51

```
[In] int(x*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
[Out] 1/2*a*x^2-b*c^2*(-1/2/c^2*x^2*arcsin(c/x)-1/2/c*x*(1-c^2/x^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.03

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}\,bx^2\arcsin\left(\frac{c}{x}\right)+\frac{1}{2}\,bcx\sqrt{-\frac{c^2-x^2}{x^2}}+\frac{1}{2}\,ax^2$$

```
[In] integrate(x*(a+b*arcsin(c/x)),x, algorithm="fricas")
[Out] 1/2*b*x^2*arcsin(c/x) + 1/2*b*c*x*sqrt(-(c^2 - x^2)/x^2) + 1/2*a*x^2
```

Sympy [A] (verification not implemented)

Time = 0.91 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.49

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^2}{2}+\frac{bc\left(\begin{cases} c\sqrt{-1+\frac{x^2}{c^2}} & \text{for}\ \left|\frac{x^2}{c^2}\right|>1\\ ic\sqrt{1-\frac{x^2}{c^2}} & \text{otherwise}\end{cases}\right)}{2}+\frac{bx^2\operatorname{asin}\left(\frac{c}{x}\right)}{2}$$

```
[In] integrate(x*(a+b*asin(c/x)),x)
[Out] a*x**2/2 + b*c*Piecewise((c*sqrt(-1 + x**2/c**2), Abs(x**2/c**2) > 1), (I*c
*sqrt(1 - x**2/c**2), True))/2 + b*x**2*asin(c/x)/2
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}\,ax^2+\frac{1}{2}\left(x^2\arcsin\left(\frac{c}{x}\right)+cx\sqrt{-\frac{c^2}{x^2}+1}\right)b$$

```
[In] integrate(x*(a+b*arcsin(c/x)),x, algorithm="maxima")
[Out] 1/2*a*x^2 + 1/2*(x^2*arcsin(c/x) + c*x*sqrt(-c^2/x^2 + 1))*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 174 vs. 2(33) = 66.

Time = 0.28 (sec) , antiderivative size = 174, normalized size of antiderivative = 4.46

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{bcx^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2\arcsin\left(\frac{c}{x}\right)+acx^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2+2\,bc^2x\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)+2\,bc^3\arcsin\left(\frac{c}{x}\right)}{8\,c}$$

```
[In] integrate(x*(a+b*arcsin(c/x)),x, algorithm="giac")
```

```
[Out] 1/8*(b*c*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2*arcsin(c/x) + a*c*x^2*(sqrt(-c^2/x^
2 + 1) + 1)^2 + 2*b*c^2*x*(sqrt(-c^2/x^2 + 1) + 1) + 2*b*c^3*arcsin(c/x) +
2*a*c^3 - 2*b*c^4/(x*(sqrt(-c^2/x^2 + 1) + 1)) + b*c^5*arcsin(c/x)/(x^2*(sq
rt(-c^2/x^2 + 1) + 1)^2) + a*c^5/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2))/c
```

Mupad [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{a\,x^2}{2}+\frac{b\,x^2\,\mathrm{asin}\left(\frac{c}{x}\right)}{2}+\frac{b\,c\,x\,\sqrt{1-\frac{c^2}{x^2}}}{2}$$

```
[In] int(x*(a + b*asin(c/x)),x)
```

```
[Out] (a*x^2)/2 + (b*x^2*asin(c/x))/2 + (b*c*x*(1 - c^2/x^2)^(1/2))/2
```

3.373 $\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$

Optimal result

Integrand size = 10, antiderivative size = 31

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=ax+bx\csc^{-1}\left(\frac{x}{c}\right)+b\text{carctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

```
[Out] a*x+b*x*arccsc(x/c)+b*c*arctanh((1-c^2/x^2)^(1/2))
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4916, 5323, 272, 65, 214}

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=ax+b\text{carctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)+bx\csc^{-1}\left(\frac{x}{c}\right)$$

```
[In] Int[a + b*ArcSin[c/x],x]
```

```
[Out] a*x + b*x*ArcCsc[x/c] + b*c*ArcTanh[Sqrt[1 - c^2/x^2]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4916

```
Int[ArcSin[(c_.)/((a_.) + (b_.)*(x_)^(n_.))]^(m_.)*(u_.), x_Symbol] :> Int[
u*ArcCsc[a/c + b*(x^n/c)]^m, x] /; FreeQ[{a, b, c, n, m}, x]
```

Rule 5323

```
Int[ArcCsc[(c_.)*(x_)], x_Symbol] :> Simp[x*ArcCsc[c*x], x] + Dist[1/c, Int
[1/(x*Sqrt[1 - 1/(c^2*x^2)]), x], x] /; FreeQ[c, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= ax + b\int \arcsin\left(\frac{c}{x}\right)\,dx\\
&= ax + b\int \csc^{-1}\left(\frac{x}{c}\right)\,dx\\
&= ax + bx\csc^{-1}\left(\frac{x}{c}\right) + (bc)\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x}\,dx\\
&= ax + bx\csc^{-1}\left(\frac{x}{c}\right) - \frac{1}{2}(bc)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right)\\
&= ax + bx\csc^{-1}\left(\frac{x}{c}\right) + \frac{b\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-\frac{c^2}{x^2}}\right)}{c}\\
&= ax + bx\csc^{-1}\left(\frac{x}{c}\right) + b\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 89 vs. 2(31) = 62.

Time = 0.06 (sec) , antiderivative size = 89, normalized size of antiderivative = 2.87

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = ax+bx\arcsin\left(\frac{c}{x}\right) + \frac{bc\sqrt{-c^2+x^2}\left(-\log\left(1-\frac{x}{\sqrt{-c^2+x^2}}\right)+\log\left(1+\frac{x}{\sqrt{-c^2+x^2}}\right)\right)}{2\sqrt{1-\frac{c^2}{x^2}}x}$$

```
[In] Integrate[a + b*ArcSin[c/x],x]
[Out] a*x + b*x*ArcSin[c/x] + (b*c*Sqrt[-c^2 + x^2]*(-Log[1 - x/Sqrt[-c^2 + x^2]]
 + Log[1 + x/Sqrt[-c^2 + x^2]]))/(2*Sqrt[1 - c^2/x^2]*x)
```

Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.19

method	result	size
default	$ax-bc\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)$	37
parts	$ax-bc\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)$	37
derivativedivides	$-c\left(-\frac{ax}{c}+b\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)\right)$	42

```
[In] int(a+b*arcsin(c/x),x,method=_RETURNVERBOSE)
[Out] a*x-b*c*(-1/c*x*arcsin(c/x)-arctanh(1/(1-c^2/x^2)^(1/2)))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 75 vs. 2(29) = 58.

Time = 0.26 (sec) , antiderivative size = 75, normalized size of antiderivative = 2.42

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = -bc\log\left(x\sqrt{-\frac{c^2-x^2}{x^2}}-x\right)+ax + (bx-b)\arcsin\left(\frac{c}{x}\right)-2\,b\arctan\left(\frac{x\sqrt{-\frac{c^2-x^2}{x^2}}-x}{c}\right)$$

```
[In] integrate(a+b*arcsin(c/x),x, algorithm="fricas")
[Out] -b*c*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + a*x + (b*x - b)*arcsin(c/x) - 2*b*
arctan((x*sqrt(-(c^2 - x^2)/x^2) - x)/c)
```

Sympy [A] (verification not implemented)

Time = 0.98 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.03

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = ax+b\left(c\left(\begin{cases}\operatorname{acosh}\left(\frac{x}{c}\right) & \text{for }\left|\frac{x^2}{c^2}\right|>1\\ -i\operatorname{asin}\left(\frac{x}{c}\right) & \text{otherwise}\end{cases}\right)+x\operatorname{asin}\left(\frac{c}{x}\right)\right)$$

```
[In] integrate(a+b*asin(c/x),x)
[Out] a*x + b*(c*Piecewise((acosh(x/c), Abs(x**2/c**2) > 1), (-I*asin(x/c), True)
) + x*asin(c/x))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.68

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{1}{2}\left(c\left(\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-\log\left(\sqrt{-\frac{c^2}{x^2}+1}-1\right)\right)+2\,x\arcsin\left(\frac{c}{x}\right)\right)b+ax$$

```
[In] integrate(a+b*arcsin(c/x),x, algorithm="maxima")
[Out] 1/2*(c*(log(sqrt(-c^2/x^2 + 1) + 1) - log(sqrt(-c^2/x^2 + 1) - 1)) + 2*x*ar
csin(c/x))*b + a*x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. 2(29) = 58.

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.94

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=ax+\frac{\left(c^2\left(\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-\log\left(-\sqrt{-\frac{c^2}{x^2}+1}+1\right)\right)+2\,cx\arcsin\left(\frac{c}{x}\right)\right)b}{2\,c}$$

```
[In] integrate(a+b*arcsin(c/x),x, algorithm="giac")
[Out] a*x + 1/2*(c^2*(log(sqrt(-c^2/x^2 + 1) + 1) - log(-sqrt(-c^2/x^2 + 1) + 1))
 + 2*c*x*arcsin(c/x))*b/c
```

Mupad [B] (verification not implemented)

Time = 0.78 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.03

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=a\,x+b\,x\,\mathrm{asin}\left(\frac{c}{x}\right)+b\,c\,\mathrm{sign}(x)\,\ln\left(x+\sqrt{x^2-c^2}\right)$$

```
[In] int(a + b*asin(c/x),x)
[Out] a*x + b*x*asin(c/x) + b*c*sign(x)*log(x + (x^2 - c^2)^(1/2))
```

3.374 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 67

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2-b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right)+a\log(x)+\frac{1}{2}ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

```
[Out] 1/2*I*b*arcsin(c/x)^2-b*arcsin(c/x)*ln(1-(I*c/x+(1-c^2/x^2)^(1/2))^2)+a*ln(
x)+1/2*I*b*polylog(2,(I*c/x+(1-c^2/x^2)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {6874, 4914, 3798, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=a\log(x)+\frac{1}{2}ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{c}{x}\right)}\right)+\frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2-b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

```
[In] Int[(a + b*ArcSin[c/x])/x,x]
```

```
[Out] (I/2)*b*ArcSin[c/x]^2 - b*ArcSin[c/x]*Log[1 - E^((2*I)*ArcSin[c/x])] + a*Lo
g[x] + (I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c/x])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4914

```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Dist[1/p, Subst[Int[x^
n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a}{x} + \frac{b \arcsin\left(\frac{c}{x}\right)}{x}\right) dx$$

$$= a\log(x) + b\int \frac{\arcsin\left(\frac{c}{x}\right)}{x}\, dx$$

$$= a\log(x) - b\text{Subst}\left(\int x\cot(x)\, dx, x, \arcsin\left(\frac{c}{x}\right)\right)$$

$$= \frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2 + a\log(x) + (2ib)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\, dx, x, \arcsin\left(\frac{c}{x}\right)\right)$$

$$= \frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2 - b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) + b\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(\frac{c}{x}\right)\right)$$

$$= \frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2 - b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) - \frac{1}{2}(ib)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

$$= \frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2 - b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) + \frac{1}{2}ib\,\text{PolyLog}\left(2, e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.91

$$\int\frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = -b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) + \frac{1}{2}ib\left(\arcsin\left(\frac{c}{x}\right)^2 + \text{PolyLog}\left(2, e^{2i\arcsin\left(\frac{c}{x}\right)}\right)\right)$$

```
[In] Integrate[(a + b*ArcSin[c/x])/x,x]
[Out] -(b*ArcSin[c/x]*Log[1 - E^((2*I)*ArcSin[c/x])]) + a*Log[x] + (I/2)*b*(ArcSi
n[c/x]^2 + PolyLog[2, E^((2*I)*ArcSin[c/x])])
```

Maple [A] (verified)

Time = 1.02 (sec) , antiderivative size = 134, normalized size of antiderivative = 2.00

method	result
parts	$a\ln(x) + b\left(\frac{i\arcsin\left(\frac{c}{x}\right)^2}{2} - \arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^2}{x^2}}\right) - \arcsin\left(\frac{c}{x}\right)\ln\left(1-\frac{ic}{x} - \right.\right.$
derivativedivides	$-a\ln\left(\frac{c}{x}\right) - b\left(-\frac{i\arcsin\left(\frac{c}{x}\right)^2}{2} + \arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^2}{x^2}}\right) - i\,\text{polylog}\left(2, -\frac{ic}{x} - \right.\right.$
default	$-a\ln\left(\frac{c}{x}\right) - b\left(-\frac{i\arcsin\left(\frac{c}{x}\right)^2}{2} + \arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^2}{x^2}}\right) - i\,\text{polylog}\left(2, -\frac{ic}{x} - \right.\right.$

```
[In] int((a+b*arcsin(c/x))/x,x,method=_RETURNVERBOSE)
[Out] a*ln(x)+b*(1/2*I*arcsin(c/x)^2-arcsin(c/x)*ln(1+I*c/x+(1-c^2/x^2)^(1/2))-ar
csin(c/x)*ln(1-I*c/x-(1-c^2/x^2)^(1/2))+I*polylog(2,-I*c/x-(1-c^2/x^2)^(1/2
))+I*polylog(2,I*c/x+(1-c^2/x^2)^(1/2)))
```

Fricas [F]

$$\int \frac{a + b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = \int \frac{b\arcsin\left(\frac{c}{x}\right) + a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(c/x))/x,x, algorithm="fricas")
[Out] integral((b*arcsin(c/x) + a)/x, x)
```

Sympy [F]

$$\int \frac{a + b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = \int \frac{a + b\operatorname{asin}\left(\frac{c}{x}\right)}{x}\,dx$$

```
[In] integrate((a+b*asin(c/x))/x,x)
[Out] Integral((a + b*asin(c/x))/x, x)
```

Maxima [F]

$$\int \frac{a + b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = \int \frac{b\arcsin\left(\frac{c}{x}\right) + a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(c/x))/x,x, algorithm="maxima")
[Out] (c*integrate(-sqrt(c + x)*sqrt(-c + x)*log(x)/(c^2*x - x^3), x) + arctan2(c
, sqrt(c + x)*sqrt(-c + x))*log(x))*b + a*log(x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c/x))/x,x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:Limit: Max order reached or unable to make series expansi
on Error: Bad Argument Value
```

Mupad [B] (verification not implemented)

Time = 0.46 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.85

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)^2\,1\mathrm{i}}{2}+a\,\ln\left(x\right)+\frac{b\,\mathrm{polylog}\left(2,\mathrm{e}^{\mathrm{asin}\left(\frac{c}{x}\right)\,2\mathrm{i}}\right)\,1\mathrm{i}}{2}-b\,\ln\left(1-\mathrm{e}^{\mathrm{asin}\left(\frac{c}{x}\right)\,2\mathrm{i}}\right)\,\mathrm{asin}\left(\frac{c}{x}\right)$$

```
[In] int((a + b*asin(c/x))/x,x)
```

```
[Out] (b*asin(c/x)^2*1i)/2 + a*log(x) + (b*polylog(2, exp(asin(c/x)*2i))*1i)/2 -
b*log(1 - exp(asin(c/x)*2i))*asin(c/x)
```

3.375 $\int \frac{a+b \arcsin\left(\frac{c}{x}\right)}{x^2} dx$

Optimal result

Integrand size = 14, antiderivative size = 39

$$\int \frac{a+b \arcsin\left(\frac{c}{x}\right)}{x^2} dx = -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c} - \frac{a}{x} - \frac{b\csc^{-1}\left(\frac{x}{c}\right)}{x}$$

```
[Out] -a/x-b*arccsc(x/c)/x-b*(1-c^2/x^2)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {6847, 4715, 267}

$$\int \frac{a+b \arcsin\left(\frac{c}{x}\right)}{x^2} dx = -\frac{a}{x} - \frac{b\sqrt{1-\frac{c^2}{x^2}}}{c} - \frac{b\csc^{-1}\left(\frac{x}{c}\right)}{x}$$

```
[In] Int[(a + b*ArcSin[c/x])/x^2,x]
```

```
[Out] -((b*Sqrt[1 - c^2/x^2])/c) - a/x - (b*ArcCsc[x/c])/x
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\text{Subst}\left(\int (a+b\arcsin(cx))\,dx, x, \frac{1}{x}\right)\\
&= -\frac{a}{x} - b\text{Subst}\left(\int \arcsin(cx)\,dx, x, \frac{1}{x}\right)\\
&= -\frac{a}{x} - \frac{b\csc^{-1}\left(\frac{x}{c}\right)}{x} + (bc)\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x^2}}\,dx, x, \frac{1}{x}\right)\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c} - \frac{a}{x} - \frac{b\csc^{-1}\left(\frac{x}{c}\right)}{x}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c} - \frac{a}{x} - \frac{b\arcsin\left(\frac{c}{x}\right)}{x}$$

```
[In] Integrate[(a + b*ArcSin[c/x])/x^2,x]
[Out] -((b*Sqrt[1 - c^2/x^2])/c) - a/x - (b*ArcSin[c/x])/x
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

method	result	size
parts	$-\frac{a}{x}-\frac{b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$	38
derivativedivides	$-\frac{\frac{ca}{x}+b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$	39
default	$-\frac{\frac{ca}{x}+b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$	39

```
[In] int((a+b*arcsin(c/x))/x^2,x,method=_RETURNVERBOSE)
[Out] -a/x-b/c*(c/x*arcsin(c/x)+(1-c^2/x^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.03

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^{2}}\,dx=-\frac{bc\arcsin\left(\frac{c}{x}\right)+bx\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}+ac}{cx}$$

```
[In] integrate((a+b*arcsin(c/x))/x^2,x, algorithm="fricas")
[Out] -(b*c*arcsin(c/x) + b*x*sqrt(-(c^2 - x^2)/x^2) + a*c)/(c*x)
```

Sympy [A] (verification not implemented)

Time = 0.41 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^{2}}\,dx=\begin{cases}-\frac{a}{x}-\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x}-\frac{b\sqrt{-\frac{c^{2}}{x^{2}}+1}}{c} & \text{for } c\neq 0\\ -\frac{a}{x} & \text{otherwise}\end{cases}$$

```
[In] integrate((a+b*asin(c/x))/x**2,x)
[Out] Piecewise((-a/x - b*asin(c/x)/x - b*sqrt(-c**2/x**2 + 1)/c, Ne(c, 0)), (-a/
x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{-\frac{c^2}{x^2}+1}\right)}{c}-\frac{a}{x}$$

```
[In] integrate((a+b*arcsin(c/x))/x^2,x, algorithm="maxima")
[Out] -b*(c*arcsin(c/x)/x + sqrt(-c^2/x^2 + 1))/c - a/x
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{\frac{bc\arcsin\left(\frac{c}{x}\right)}{x}+b\sqrt{-\frac{c^2}{x^2}+1}+\frac{ac}{x}}{c}$$

```
[In] integrate((a+b*arcsin(c/x))/x^2,x, algorithm="giac")
[Out] -(b*c*arcsin(c/x)/x + b*sqrt(-c^2/x^2 + 1) + a*c/x)/c
```

Mupad [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{a}{x}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c}-\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x}$$

```
[In] int((a + b*asin(c/x))/x^2,x)
[Out] - a/x - (b*(1 - c^2/x^2)^(1/2))/c - (b*asin(c/x))/x
```

3.376 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 57

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{4cx}+\frac{b\csc^{-1}\left(\frac{x}{c}\right)}{4c^2}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

```
[Out] 1/4*b*arccsc(x/c)/c^2+1/2*(-a-b*arcsin(c/x))/x^2-1/4*b*(1-c^2/x^2)^(1/2)/c/
x
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {4926, 12, 342, 327, 222}

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx=-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{4cx}+\frac{b\csc^{-1}\left(\frac{x}{c}\right)}{4c^2}$$

```
[In] Int[(a + b*ArcSin[c/x])/x^3,x]
```

```
[Out] -1/4*(b*Sqrt[1 - c^2/x^2])/(c*x) + (b*ArcCsc[x/c])/(4*c^2) - (a + b*ArcSin[
c/x])/(2*x^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 342

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Subst[Int[(a +
b/x^n)^p/x^(m + 2), x], x, 1/x] /; FreeQ[{a, b, p}, x] && ILtQ[n, 0] && Int
egerQ[m]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}-\frac{1}{2}b\int\frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^4}\,dx\\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}-\frac{1}{2}(bc)\int\frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^4}\,dx\\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}+\frac{1}{2}(bc)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx,x,\frac{1}{x}\right)\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{4cx}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}+\frac{b\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x^2}}\,dx,x,\frac{1}{x}\right)}{4c}\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{4cx}+\frac{b\csc^{-1}\left(\frac{x}{c}\right)}{4c^2}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.14

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2x^2}-\frac{b\sqrt{\frac{-c^2+x^2}{x^2}}}{4cx}+\frac{b\arcsin\left(\frac{c}{x}\right)}{4c^2}-\frac{b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

```
[In] Integrate[(a + b*ArcSin[c/x])/x^3,x]
```

```
[Out] -1/2*a/x^2 - (b*Sqrt[(-c^2 + x^2)/x^2])/(4*c*x) + (b*ArcSin[c/x])/(4*c^2) -
 (b*ArcSin[c/x])/(2*x^2)
```

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.96

method	result	size
parts	$-\frac{a}{2x^2}-\frac{b\left(\frac{c^2\arcsin\left(\frac{c}{x}\right)}{2x^2}+\frac{c\sqrt{1-\frac{c^2}{x^2}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^2}$	55
derivativedivides	$-\frac{\frac{a\,c^2}{2x^2}+b\left(\frac{c^2\arcsin\left(\frac{c}{x}\right)}{2x^2}+\frac{c\sqrt{1-\frac{c^2}{x^2}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^2}$	59
default	$-\frac{\frac{a\,c^2}{2x^2}+b\left(\frac{c^2\arcsin\left(\frac{c}{x}\right)}{2x^2}+\frac{c\sqrt{1-\frac{c^2}{x^2}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^2}$	59

```
[In] int((a+b*arcsin(c/x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/x^2-b/c^2*(1/2*c^2/x^2*arcsin(c/x)+1/4*c/x*(1-c^2/x^2)^(1/2)-1/4*arc
sin(c/x))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.96

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{bcx\sqrt{-\frac{c^2-x^2}{x^2}}+2\,ac^2+\left(2\,bc^2-bx^2\right)\arcsin\left(\frac{c}{x}\right)}{4\,c^2x^2}$$

```
[In] integrate((a+b*arcsin(c/x))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(b*c*x*sqrt(-(c^2 - x^2)/x^2) + 2*a*c^2 + (2*b*c^2 - b*x^2)*arcsin(c/x
))/(c^2*x^2)
```

Sympy [A] (verification not implemented)

Time = 1.94 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.96

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{bc\left(\begin{cases} \frac{i\sqrt{\frac{c^2}{x^2}-1}}{2c^2x} + \frac{i\operatorname{acosh}\left(\frac{c}{x}\right)}{2c^3} & \text{for } \left|\frac{c^2}{x^2}\right| > 1 \\ -\frac{1}{2x^3\sqrt{-\frac{c^2}{x^2}+1}} + \frac{1}{2c^2x\sqrt{-\frac{c^2}{x^2}+1}} - \frac{\operatorname{asin}\left(\frac{c}{x}\right)}{2c^3} & \text{otherwise} \end{cases}\right)}{2} - \frac{b\operatorname{asin}\left(\frac{c}{x}\right)}{2x^2}$$

```
[In] integrate((a+b*asin(c/x))/x**3,x)
```

```
[Out] -a/(2*x**2) - b*c*Piecewise((I*sqrt(c**2/x**2 - 1)/(2*c**2*x) + I*acosh(c/x
)/(2*c**3), Abs(c**2/x**2) > 1), (-1/(2*x**3*sqrt(-c**2/x**2 + 1)) + 1/(2*c
**2*x*sqrt(-c**2/x**2 + 1)) - asin(c/x)/(2*c**3), True))/2 - b*asin(c/x)/(2
*x**2)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.51

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = \frac{1}{4}\left(c\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c^2x^2\left(\frac{c^2}{x^2}-1\right)-c^4} - \frac{\arctan\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c}\right)}{c^3}\right) - \frac{2\arcsin\left(\frac{c}{x}\right)}{x^2}\right)b - \frac{a}{2\,x^2}$$

```
[In] integrate((a+b*arcsin(c/x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*(c*(x*sqrt(-c^2/x^2 + 1)/(c^2*x^2*(c^2/x^2 - 1) - c^4) - arctan(x*sqrt(
-c^2/x^2 + 1)/c)/c^3) - 2*arcsin(c/x)/x^2)*b - 1/2*a/x^2
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{\frac{2\,b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{c} + \frac{2\,a\left(\frac{c^2}{x^2}-1\right)}{c} + \frac{b\arcsin\left(\frac{c}{x}\right)}{c} + \frac{b\sqrt{-\frac{c^2}{x^2}+1}}{x}}{4\,c}$$

```
[In] integrate((a+b*arcsin(c/x))/x^3,x, algorithm="giac")
```

```
[Out] -1/4*(2*b*(c^2/x^2 - 1)*arcsin(c/x)/c + 2*a*(c^2/x^2 - 1)/c + b*arcsin(c/x)
/c + b*sqrt(-c^2/x^2 + 1)/x)/c
```

Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2\,x^2} - \frac{b\,\sqrt{1-\frac{c^2}{x^2}}}{4\,c\,x} - \frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)\,\left(\frac{2\,c^2}{x^2}-1\right)}{4\,c^2}$$

```
[In] int((a + b*asin(c/x))/x^3,x)
```

```
[Out] - a/(2*x^2) - (b*(1 - c^2/x^2)^(1/2))/(4*c*x) - (b*asin(c/x)*((2*c^2)/x^2 -
 1))/(4*c^2)
```

3.377 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 62

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{3c^3}+\frac{b\left(1-\frac{c^2}{x^2}\right)^{3/2}}{9c^3}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

```
[Out] 1/9*b*(1-c^2/x^2)^(3/2)/c^3+1/3*(-a-b*arcsin(c/x))/x^3-1/3*b*(1-c^2/x^2)^(1
/2)/c^3
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4926, 12, 272, 45}

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{b\left(1-\frac{c^2}{x^2}\right)^{3/2}}{9c^3}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{3c^3}$$

```
[In] Int[(a + b*ArcSin[c/x])/x^4,x]
```

```
[Out] -1/3*(b*Sqrt[1 - c^2/x^2])/c^3 + (b*(1 - c^2/x^2)^(3/2))/(9*c^3) - (a + b*A
rcSin[c/x])/(3*x^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3} - \frac{1}{3}b\int \frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^5}\,dx \\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3} - \frac{1}{3}(bc)\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^5}\,dx \\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3} + \frac{1}{6}(bc)\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x}}\,dx, x, \frac{1}{x^2}\right) \\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3} + \frac{1}{6}(bc)\text{Subst}\left(\int \left(\frac{1}{c^2\sqrt{1-c^2x}} - \frac{\sqrt{1-c^2x}}{c^2}\right)dx, x, \frac{1}{x^2}\right) \\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{3c^3} + \frac{b\left(1-\frac{c^2}{x^2}\right)^{3/2}}{9c^3} - \frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=-\frac{a}{3x^3}+b\left(-\frac{2}{9c^3}-\frac{1}{9cx^2}\right)\sqrt{\frac{-c^2+x^2}{x^2}}-\frac{b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

```
[In] Integrate[(a + b*ArcSin[c/x])/x^4,x]
```

```
[Out] -1/3*a/x^3 + b*(-2/(9*c^3) - 1/(9*c*x^2))*Sqrt[(-c^2 + x^2)/x^2] - (b*ArcSi
n[c/x])/(3*x^3)
```

Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.02

method	result	size
parts	$-\frac{a}{3x^3}-\frac{b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$	63
derivativedivides	$-\frac{\frac{a\,c^3}{3x^3}+b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$	67
default	$-\frac{\frac{a\,c^3}{3x^3}+b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$	67

```
[In] int((a+b*arcsin(c/x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/x^3-b/c^3*(1/3*c^3/x^3*arcsin(c/x)+1/9*c^2/x^2*(1-c^2/x^2)^(1/2)+2/9
*(1-c^2/x^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=-\frac{3\,bc^3\arcsin\left(\frac{c}{x}\right)+3\,ac^3+(bc^2x+2\,bx^3)\sqrt{-\frac{c^2-x^2}{x^2}}}{9\,c^3x^3}$$

```
[In] integrate((a+b*arcsin(c/x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(3*b*c^3*arcsin(c/x) + 3*a*c^3 + (b*c^2*x + 2*b*x^3)*sqrt(-(c^2 - x^2)
/x^2))/(c^3*x^3)
```

Sympy [A] (verification not implemented)

Time = 1.67 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.81

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{a}{3x^3} - \frac{bc\left(\begin{cases}\frac{\sqrt{-1+\frac{x^2}{c^2}}}{3cx^3} + \frac{2\sqrt{-1+\frac{x^2}{c^2}}}{3c^3x} & \text{for } \left|\frac{x^2}{c^2}\right| > 1 \\ \frac{i\sqrt{1-\frac{x^2}{c^2}}}{3cx^3} + \frac{2i\sqrt{1-\frac{x^2}{c^2}}}{3c^3x} & \text{otherwise}\end{cases}\right)}{3} - \frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)}{3x^3}$$

```
[In] integrate((a+b*asin(c/x))/x**4,x)
```

```
[Out] -a/(3*x**3) - b*c*Piecewise((sqrt(-1 + x**2/c**2)/(3*c*x**3) + 2*sqrt(-1 +
x**2/c**2)/(3*c**3*x), Abs(x**2/c**2) > 1), (I*sqrt(1 - x**2/c**2)/(3*c*x**
3) + 2*I*sqrt(1 - x**2/c**2)/(3*c**3*x), True))/3 - b*asin(c/x)/(3*x**3)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = \frac{1}{9}\left(c\left(\frac{\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^4} - \frac{3\sqrt{-\frac{c^2}{x^2}+1}}{c^4}\right) - \frac{3\arcsin\left(\frac{c}{x}\right)}{x^3}\right)b - \frac{a}{3x^3}$$

```
[In] integrate((a+b*arcsin(c/x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/9*(c*((-c^2/x^2 + 1)^(3/2)/c^4 - 3*sqrt(-c^2/x^2 + 1)/c^4) - 3*arcsin(c/x
)/x^3)*b - 1/3*a/x^3
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.42

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{\frac{3b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{cx} - \frac{b\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^2} + \frac{3b\arcsin\left(\frac{c}{x}\right)}{cx} + \frac{3b\sqrt{-\frac{c^2}{x^2}+1}}{c^2} + \frac{3ac}{x^3}}{9c}$$

```
[In] integrate((a+b*arcsin(c/x))/x^4,x, algorithm="giac")
```

```
[Out] -1/9*(3*b*(c^2/x^2 - 1)*arcsin(c/x)/(c*x) - b*(-c^2/x^2 + 1)^(3/2)/c^2 + 3*
b*arcsin(c/x)/(c*x) + 3*b*sqrt(-c^2/x^2 + 1)/c^2 + 3*a*c/x^3)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=\int \frac{a+b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x^4}\,dx$$

```
[In] int((a + b*asin(c/x))/x^4,x)
[Out] int((a + b*asin(c/x))/x^4, x)
```

3.378 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{3b\sqrt{1-\frac{c^2}{x^2}}}{32c^3x}+\frac{3b\csc^{-1}\left(\frac{x}{c}\right)}{32c^4}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

```
[Out] 3/32*b*arccsc(x/c)/c^4+1/4*(-a-b*arcsin(c/x))/x^4-1/16*b*(1-c^2/x^2)^(1/2)/
c/x^3-3/32*b*(1-c^2/x^2)^(1/2)/c^3/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {4926, 12, 342, 327, 222}

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx=-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{3b\csc^{-1}\left(\frac{x}{c}\right)}{32c^4}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{3b\sqrt{1-\frac{c^2}{x^2}}}{32c^3x}$$

```
[In] Int[(a + b*ArcSin[c/x])/x^5,x]
```

```
[Out] -1/16*(b*Sqrt[1 - c^2/x^2])/(c*x^3) - (3*b*Sqrt[1 - c^2/x^2])/(32*c^3*x) +
(3*b*ArcCsc[x/c])/(32*c^4) - (a + b*ArcSin[c/x])/(4*x^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 342

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Subst[Int[(a +
b/x^n)^p/x^(m + 2), x], x, 1/x] /; FreeQ[{a, b, p}, x] && ILtQ[n, 0] && Int
egerQ[m]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}-\frac{1}{4}b\int\frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^6}\,dx\\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}-\frac{1}{4}(bc)\int\frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^6}\,dx\\
&= -\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{1}{4}(bc)\text{Subst}\left(\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx,x,\frac{1}{x}\right)\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{(3b)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx,x,\frac{1}{x}\right)}{16c}\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{3b\sqrt{1-\frac{c^2}{x^2}}}{32c^3x}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{(3b)\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x^2}}\,dx,x,\frac{1}{x}\right)}{32c^3}\\
&= -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{3b\sqrt{1-\frac{c^2}{x^2}}}{32c^3x}+\frac{3b\csc^{-1}\left(\frac{x}{c}\right)}{32c^4}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{a}{4x^4}+b\left(-\frac{1}{16cx^3}-\frac{3}{32c^3x}\right)\sqrt{\frac{-c^2+x^2}{x^2}} + \frac{3b\arcsin\left(\frac{c}{x}\right)}{32c^4}-\frac{b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

```
[In] Integrate[(a + b*ArcSin[c/x])/x^5,x]
```

```
[Out] -1/4*a/x^4 + b*(-1/16*1/(c*x^3) - 3/(32*c^3*x))*Sqrt[(-c^2 + x^2)/x^2] + (3
*b*ArcSin[c/x])/(32*c^4) - (b*ArcSin[c/x])/(4*x^4)
```

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.91

method	result	size
parts	$-\frac{a}{4x^4}-\frac{b\left(\frac{c^4\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$	75
derivativedivides	$-\frac{\frac{a\,c^4}{4x^4}+b\left(\frac{c^4\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$	79
default	$-\frac{\frac{a\,c^4}{4x^4}+b\left(\frac{c^4\arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$	79

```
[In] int((a+b*arcsin(c/x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/x^4-b/c^4*(1/4*c^4/x^4*arcsin(c/x)+1/16*c^3/x^3*(1-c^2/x^2)^(1/2)+3/
32*c/x*(1-c^2/x^2)^(1/2)-3/32*arcsin(c/x))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{8\,ac^4+\left(8\,bc^4-3\,bx^4\right)\arcsin\left(\frac{c}{x}\right)+\left(2\,bc^3x+3\,bcx^3\right)\sqrt{-\frac{c^2-x^2}{x^2}}}{32\,c^4x^4}$$

```
[In] integrate((a+b*arcsin(c/x))/x^5,x, algorithm="fricas")
```

```
[Out] -1/32*(8*a*c^4 + (8*b*c^4 - 3*b*x^4)*arcsin(c/x) + (2*b*c^3*x + 3*b*c*x^3)*
sqrt(-(c^2 - x^2)/x^2))/(c^4*x^4)
```

Sympy [A] (verification not implemented)

Time = 3.78 (sec) , antiderivative size = 180, normalized size of antiderivative = 2.20

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{a}{4x^4} - \frac{bc\left(\begin{cases} \frac{i}{4x^5\sqrt{\frac{c^2}{x^2}-1}} + \frac{i}{8c^2x^3\sqrt{\frac{c^2}{x^2}-1}} - \frac{3i}{8c^4x\sqrt{\frac{c^2}{x^2}-1}} + \frac{3i\operatorname{acosh}\left(\frac{c}{x}\right)}{8c^5} & \text{for } \left|\frac{c^2}{x^2}\right| > 1 \\ -\frac{1}{4x^5\sqrt{-\frac{c^2}{x^2}+1}} - \frac{1}{8c^2x^3\sqrt{-\frac{c^2}{x^2}+1}} + \frac{3}{8c^4x\sqrt{-\frac{c^2}{x^2}+1}} - \frac{3\operatorname{asin}\left(\frac{c}{x}\right)}{8c^5} & \text{otherwise} \end{cases}\right)}{4} - \frac{b\operatorname{asin}\left(\frac{c}{x}\right)}{4x^4}$$

```
[In] integrate((a+b*asin(c/x))/x**5,x)
```

```
[Out] -a/(4*x**4) - b*c*Piecewise((I/(4*x**5*sqrt(c**2/x**2 - 1)) + I/(8*c**2*x**
3*sqrt(c**2/x**2 - 1)) - 3*I/(8*c**4*x*sqrt(c**2/x**2 - 1)) + 3*I*acosh(c/x
)/(8*c**5), Abs(c**2/x**2) > 1), (-1/(4*x**5*sqrt(-c**2/x**2 + 1)) - 1/(8*c
**2*x**3*sqrt(-c**2/x**2 + 1)) + 3/(8*c**4*x*sqrt(-c**2/x**2 + 1)) - 3*asin
(c/x)/(8*c**5), True))/4 - b*asin(c/x)/(4*x**4)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.54

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{1}{32}\left(c\left(\frac{3\,x^3\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}} + 5\,c^2x\sqrt{-\frac{c^2}{x^2}+1}}{c^4x^4\left(\frac{c^2}{x^2}-1\right)^2 - 2\,c^6x^2\left(\frac{c^2}{x^2}-1\right) + c^8} + \frac{3\,\arctan\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c}\right)}{c^5}\right) + \frac{8\,\arcsin\left(\frac{c}{x}\right)}{x^4}\right)b - \frac{a}{4\,x^4}$$

```
[In] integrate((a+b*arcsin(c/x))/x^5,x, algorithm="maxima")
```

```
[Out] -1/32*(c*((3*x^3*(-c^2/x^2 + 1)^(3/2) + 5*c^2*x*sqrt(-c^2/x^2 + 1))/(c^4*x^
4*(c^2/x^2 - 1)^2 - 2*c^6*x^2*(c^2/x^2 - 1) + c^8) + 3*arctan(x*sqrt(-c^2/x
^2 + 1)/c)/c^5) + 8*arcsin(c/x)/x^4)*b - 1/4*a/x^4
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.35

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{\frac{8\,b\left(\frac{c^2}{x^2}-1\right)^2\arcsin\left(\frac{c}{x}\right)}{c^3}+\frac{16\,b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{c^3}-\frac{2\,b\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^2x}+\frac{5\,b\arcsin\left(\frac{c}{x}\right)}{c^3}+\frac{5\,b\sqrt{-\frac{c^2}{x^2}+1}}{c^2x}+\frac{8\,ac}{x^4}}{32\,c}$$

```
[In] integrate((a+b*arcsin(c/x))/x^5,x, algorithm="giac")
```

```
[Out] -1/32*(8*b*(c^2/x^2 - 1)^2*arcsin(c/x)/c^3 + 16*b*(c^2/x^2 - 1)*arcsin(c/x)
/c^3 - 2*b*(-c^2/x^2 + 1)^(3/2)/(c^2*x) + 5*b*arcsin(c/x)/c^3 + 5*b*sqrt(-c
^2/x^2 + 1)/(c^2*x) + 8*a*c/x^4)/c
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = \int \frac{a+b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x^5}\,dx$$

```
[In] int((a + b*asin(c/x))/x^5,x)
```

```
[Out] int((a + b*asin(c/x))/x^5, x)
```

3.379 $\int x^m(a+b\arcsin(cx^n))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 81

$$\int x^m(a+b\arcsin(cx^n))\,dx=\frac{x^{1+m}(a+b\arcsin(cx^n))}{1+m}-\frac{bcnx^{1+m+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m+n}{2n},\frac{1+m+3n}{2n},c^2x^{2n}\right)}{(1+m)(1+m+n)}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x^n))/(1+m)-b*c*n*x^(1+m+n)*hypergeom([1/2, 1/2*(1+m+
n)/n],[1/2*(1+m+3*n)/n],c^2*x^(2*n))/(1+m)/(1+m+n)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 371}

$$\int x^m(a+b\arcsin(cx^n))\,dx=\frac{x^{m+1}(a+b\arcsin(cx^n))}{m+1}-\frac{bcnx^{m+n+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+n+1}{2n},\frac{m+3n+1}{2n},c^2x^{2n}\right)}{(m+1)(m+n+1)}$$

```
[In] Int[x^m*(a + b*ArcSin[c*x^n]),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x^n]))/(1 + m) - (b*c*n*x^(1 + m + n)*Hypergeome
tric2F1[1/2, (1 + m + n)/(2*n), (1 + m + 3*n)/(2*n), c^2*x^(2*n)])/((1 + m)
*(1 + m + n))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx^n))}{1+m}-\frac{b\int\frac{cnx^{m+n}}{\sqrt{1-c^2x^{2n}}}\,dx}{1+m}\\ &= \frac{x^{1+m}(a+b\arcsin(cx^n))}{1+m}-\frac{(bcn)\int\frac{x^{m+n}}{\sqrt{1-c^2x^{2n}}}\,dx}{1+m}\\ &= \frac{x^{1+m}(a+b\arcsin(cx^n))}{1+m}-\frac{bcnx^{1+m+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m+n}{2n},\frac{1+m+3n}{2n},c^2x^{2n}\right)}{(1+m)(1+m+n)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.96

$$\int x^m(a+b\arcsin(cx^n))\,dx = \frac{x^{1+m}\left((1+m+n)(a+b\arcsin(cx^n))-bcnx^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m+n}{2n},\frac{1+m+3n}{2n},c^2x^{2n}\right)\right)}{(1+m)(1+m+n)}$$

```
[In] Integrate[x^m*(a + b*ArcSin[c*x^n]),x]
[Out] (x^(1 + m)*((1 + m + n)*(a + b*ArcSin[c*x^n]) - b*c*n*x^n*Hypergeometric2F1
[1/2, (1 + m + n)/(2*n), (1 + m + 3*n)/(2*n), c^2*x^(2*n)]))/((1 + m)*(1 +
m + n))
```

Maple [F]

$$\int x^m(a+b\arcsin(c\,x^n))\,dx$$

```
[In] int(x^m*(a+b*arcsin(c*x^n)),x)
[Out] int(x^m*(a+b*arcsin(c*x^n)),x)
```

Fricas [F(-2)]

Exception generated.

$$\int x^m(a+b\arcsin(cx^n))\ dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]

$$\int x^m(a+b\arcsin(cx^n))\ dx = \int x^m(a+b\,\mathrm{asin}\,(cx^n))\ dx$$

```
[In] integrate(x**m*(a+b*asin(c*x**n)),x)
[Out] Integral(x**m*(a + b*asin(c*x**n)), x)
```

Maxima [F]

$$\int x^m(a+b\arcsin(cx^n))\ dx = \int (b\arcsin(cx^n)+a)x^m\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
[Out] (x*x^m*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + (c*m + c)*n*integ
rate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*e^(m*log(x) + n*log(x))/((c^2*m + c^2
)*x^(2*n) - m - 1), x))*b/(m + 1) + a*x^(m + 1)/(m + 1)
```

Giac [F]

$$\int x^m(a+b\arcsin(cx^n))\,dx=\int(b\arcsin(cx^n)+a)x^m\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^n) + a)*x^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^m(a+b\arcsin(cx^n))\,dx=\int x^m\,(a+b\,\mathrm{asin}(c\,x^n))\,dx$$

```
[In] int(x^m*(a + b*asin(c*x^n)),x)
[Out] int(x^m*(a + b*asin(c*x^n)), x)
```

3.380 $\int x^2(a+b\arcsin(cx^n))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 68

$$\int x^2(a+b\arcsin(cx^n))\,dx=\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{bcnx^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2n},\frac{3(1+n)}{2n},c^2x^{2n}\right)}{3(3+n)}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x^n))-1/3*b*c*n*x^(3+n)*hypergeom([1/2, 1/2*(3+n)/n],
[3/2*(1+n)/n],c^2*x^(2*n))/(3+n)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 371}

$$\int x^2(a+b\arcsin(cx^n))\,dx=\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{bcnx^{n+3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+3}{2n},\frac{3(n+1)}{2n},c^2x^{2n}\right)}{3(n+3)}$$

```
[In] Int[x^2*(a + b*ArcSin[c*x^n]),x]
```

```
[Out] (x^3*(a + b*ArcSin[c*x^n]))/3 - (b*c*n*x^(3 + n)*Hypergeometric2F1[1/2, (3
+ n)/(2*n), (3*(1 + n))/(2*n), c^2*x^(2*n)])/(3*(3 + n))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{3}x^3(a+b\arcsin(cx^n)) - \frac{1}{3}b\int \frac{cnx^{2+n}}{\sqrt{1-c^2x^{2n}}}\,dx\\ &= \frac{1}{3}x^3(a+b\arcsin(cx^n)) - \frac{1}{3}(bcn)\int \frac{x^{2+n}}{\sqrt{1-c^2x^{2n}}}\,dx\\ &= \frac{1}{3}x^3(a+b\arcsin(cx^n)) - \frac{bcnx^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2n},\frac{3(1+n)}{2n},c^2x^{2n}\right)}{3(3+n)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.10

$$\int x^2(a+b\arcsin(cx^n))\,dx = \frac{ax^3}{3} + \frac{1}{3}bx^3\arcsin(cx^n) - \frac{bcnx^{3+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2n},1+\frac{3+n}{2n},c^2x^{2n}\right)}{3(3+n)}$$

```
[In] Integrate[x^2*(a + b*ArcSin[c*x^n]),x]
```

```
[Out] (a*x^3)/3 + (b*x^3*ArcSin[c*x^n])/3 - (b*c*n*x^(3 + n)*Hypergeometric2F1[1/
2, (3 + n)/(2*n), 1 + (3 + n)/(2*n), c^2*x^(2*n)])/(3*(3 + n))
```

Maple [F]

$$\int x^2(a + b \arcsin(c\,x^n))\,dx$$

[In] int(x^2*(a+b*arcsin(c*x^n)),x)

[Out] int(x^2*(a+b*arcsin(c*x^n)),x)

Fricas [F(-2)]

Exception generated.

$$\int x^2(a + b \arcsin(cx^n))\;dx = \text{Exception raised: TypeError}$$

[In] integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (has polynomial part)

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 3.95 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.21

$$\int x^2(a+b\arcsin(cx^n))\;dx = \frac{ax^3}{3} + \frac{ibcc^{\frac{3}{n}}c^{-1-\frac{3}{n}}x^3\Gamma\left(\frac{3}{2n}\right){}_2F_1\left(\begin{matrix}\frac{1}{2}, -\frac{3}{2n}\\ 1-\frac{3}{2n}\end{matrix}\middle|\frac{x^{-2n}}{c^2}\right)}{6\Gamma\left(1+\frac{3}{2n}\right)} + \frac{bx^3\operatorname{asin}(cx^n)}{3}$$

[In] integrate(x**2*(a+b*asin(c*x**n)),x)

[Out] a*x**3/3 + I*b*c*c**(3/n)*c**(-1 - 3/n)*x**3*gamma(3/(2*n))*hyper((1/2, -3/
(2*n)), (1 - 3/(2*n),), 1/(c**2*x**(2*n)))/(6*gamma(1 + 3/(2*n))) + b*x**3*
asin(c*x**n)/3

Maxima [F]

$$\int x^2(a + b \arcsin(cx^n)) \, dx = \int (b \arcsin(cx^n) + a)x^2 \, dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/3*a*x^3 + 1/3*(x^3*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + 3*c
*n*integrate(1/3*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^2*x^n/(c^2*x^(2*n) - 1)
, x))*b
```

Giac [F]

$$\int x^2(a + b \arcsin(cx^n)) \, dx = \int (b \arcsin(cx^n) + a)x^2 \, dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^n) + a)*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2(a + b \arcsin(cx^n)) \, dx = \int x^2 (a + b \operatorname{asin}(c x^n)) \, dx$$

```
[In] int(x^2*(a + b*asin(c*x^n)),x)
```

```
[Out] int(x^2*(a + b*asin(c*x^n)), x)
```

3.381 $\int x(a+b\arcsin(cx^n))\,dx$

Optimal result

Integrand size = 12, antiderivative size = 69

$$\int x(a+b\arcsin(cx^n))\,dx=\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{bcnx^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2n},\frac{1}{2}\left(3+\frac{2}{n}\right),c^2x^{2n}\right)}{2(2+n)}$$

```
[Out] 1/2*x^2*(a+b*arcsin(c*x^n))-1/2*b*c*n*x^(2+n)*hypergeom([1/2, 1/2*(2+n)/n],
[3/2+1/n],c^2*x^(2*n))/(2+n)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4926, 12, 371}

$$\int x(a+b\arcsin(cx^n))\,dx=\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{bcnx^{n+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+2}{2n},\frac{1}{2}\left(3+\frac{2}{n}\right),c^2x^{2n}\right)}{2(n+2)}$$

```
[In] Int[x*(a + b*ArcSin[c*x^n]),x]
```

```
[Out] (x^2*(a + b*ArcSin[c*x^n]))/2 - (b*c*n*x^(2 + n)*Hypergeometric2F1[1/2, (2
+ n)/(2*n), (3 + 2/n)/2, c^2*x^(2*n)])/(2*(2 + n))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{2}x^2(a+b\arcsin(cx^n)) - \frac{1}{2}b\int \frac{cnx^{1+n}}{\sqrt{1-c^2x^{2n}}}\,dx \\
&= \frac{1}{2}x^2(a+b\arcsin(cx^n)) - \frac{1}{2}(bcn)\int \frac{x^{1+n}}{\sqrt{1-c^2x^{2n}}}\,dx \\
&= \frac{1}{2}x^2(a+b\arcsin(cx^n)) - \frac{bcnx^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2n},\frac{1}{2}\left(3+\frac{2}{n}\right),c^2x^{2n}\right)}{2(2+n)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.09

$$
\int x(a+b\arcsin(cx^n))\,dx = \frac{ax^2}{2} + \frac{1}{2}bx^2\arcsin(cx^n) - \frac{bcnx^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2n},1+\frac{2+n}{2n},c^2x^{2n}\right)}{2(2+n)}
$$

```
[In] Integrate[x*(a + b*ArcSin[c*x^n]),x]
```

```
[Out] (a*x^2)/2 + (b*x^2*ArcSin[c*x^n])/2 - (b*c*n*x^(2 + n)*Hypergeometric2F1[1/
2, (2 + n)/(2*n), 1 + (2 + n)/(2*n), c^2*x^(2*n)])/(2*(2 + n))
```

Maple [F]

$$\int x(a+b\arcsin{(c\,x^{n})})\,dx$$

```
[In] int(x*(a+b*arcsin(c*x^n)),x)
[Out] int(x*(a+b*arcsin(c*x^n)),x)
```

Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin{(cx^{n})})\;dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.22 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.09

$$\int x(a+b\arcsin{(cx^{n})})\;dx = \frac{ax^{2}}{2} + \frac{ibcc^{\frac{2}{n}}c^{-1-\frac{2}{n}}x^{2}\Gamma\left(\frac{1}{n}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},-\frac{1}{n}\\1-\frac{1}{n}\end{matrix}\middle|\frac{x^{-2n}}{c^{2}}\right)}{4\Gamma\left(1+\frac{1}{n}\right)} + \frac{bx^{2}\operatorname{asin}{(cx^{n})}}{2}$$

```
[In] integrate(x*(a+b*asin(c*x**n)),x)
[Out] a*x**2/2 + I*b*c*c**(2/n)*c**(-1 - 2/n)*x**2*gamma(1/n)*hyper((1/2, -1/n),
(1 - 1/n,), 1/(c**2*x**(2*n)))/(4*gamma(1 + 1/n)) + b*x**2*asin(c*x**n)/2
```

Maxima [F]

$$\int x(a+b\arcsin{(cx^{n})})\;dx = \int (b\arcsin{(cx^{n})}+a)x\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
[Out] 1/2*a*x^2 + 1/2*(x^2*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + 2*c
*n*integrate(1/2*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x*x^n/(c^2*x^(2*n) - 1),
x))*b
```

Giac [F]

$$\int x(a+b\arcsin(cx^n))\,dx=\int(b\arcsin(cx^n)+a)x\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x^n) + a)*x, x)
```

Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(cx^n))\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x^n))\,dx$$

```
[In] int(x*(a + b*asin(c*x^n)),x)
[Out] int(x*(a + b*asin(c*x^n)), x)
```

3.382 $\int (a+b\arcsin(cx^n))\,dx$

Optimal result

Integrand size = 10, antiderivative size = 60

$$\int (a+b\arcsin(cx^n))\,dx = ax+bx\arcsin(cx^n) - \frac{bcnx^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{1+n}$$

```
[Out] a*x+b*x*arcsin(c*x^n)-b*c*n*x^(1+n)*hypergeom([1/2, 1/2*(1+n)/n],[3/2+1/2/n
],c^2*x^(2*n))/(1+n)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4924, 12, 371}

$$\int (a+b\arcsin(cx^n))\,dx = ax+bx\arcsin(cx^n) - \frac{bcnx^{n+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+1}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{n+1}$$

```
[In] Int[a + b*ArcSin[c*x^n],x]
```

```
[Out] a*x + b*x*ArcSin[c*x^n] - (b*c*n*x^(1 + n)*Hypergeometric2F1[1/2, (1 + n)/(
2*n), (3 + n^(-1))/2, c^2*x^(2*n)])/(1 + n)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] && !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= ax + b\int \arcsin(cx^n)\,dx\\
&= ax + bx\arcsin(cx^n) - b\int \frac{cnx^n}{\sqrt{1-c^2x^{2n}}}\,dx\\
&= ax + bx\arcsin(cx^n) - (bcn)\int \frac{x^n}{\sqrt{1-c^2x^{2n}}}\,dx\\
&= ax + bx\arcsin(cx^n) - \frac{bcnx^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{1+n}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00

$$\int (a+b\arcsin(cx^n))\,dx = ax + bx\arcsin(cx^n) - \frac{bcnx^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{1+n}$$

```
[In] Integrate[a + b*ArcSin[c*x^n],x]
```

```
[Out] a*x + b*x*ArcSin[c*x^n] - (b*c*n*x^(1 + n)*Hypergeometric2F1[1/2, (1 + n)/(
2*n), (3 + n^(-1))/2, c^2*x^(2*n)])/(1 + n)
```

Maple [F]

$$\int (a+b\arcsin (c\,x^{n}))\,dx$$

```
[In] int(a+b*arcsin(c*x^n),x)
```

```
[Out] int(a+b*arcsin(c*x^n),x)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(cx^n))\ dx = \text{Exception raised: TypeError}$$

```
[In] integrate(a+b*arcsin(c*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.31 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.18

$$\int (a+b\arcsin(cx^n))\ dx = ax+b\left(\frac{icc^{\frac{1}{n}}c^{-1-\frac{1}{n}}x\Gamma\left(\frac{1}{2n}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{1}{2n}\\1-\frac{1}{2n}\end{matrix}\middle|\frac{x^{-2n}}{c^2}\right)}{2\Gamma\left(1+\frac{1}{2n}\right)}+x\,\text{asin}\,(cx^n)\right)$$

```
[In] integrate(a+b*asin(c*x**n),x)
```

```
[Out] a*x + b*(I*c*c**(1/n)*c**(-1 - 1/n)*x*gamma(1/(2*n))*hyper((1/2, -1/(2*n)),
 (1 - 1/(2*n),), 1/(c**2*x**(2*n)))/(2*gamma(1 + 1/(2*n))) + x*asin(c*x**n)
)
```

Maxima [F]

$$\int (a + b \arcsin (cx^n)) \, dx = \int b \arcsin (cx^n) + a \, dx$$

```
[In] integrate(a+b*arcsin(c*x^n),x, algorithm="maxima")
```

```
[Out] (c*n*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^(2*n) - 1), x) +
 x*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b + a*x
```

Giac [F]

$$\int (a + b \arcsin (cx^n)) \, dx = \int b \arcsin (cx^n) + a \, dx$$

```
[In] integrate(a+b*arcsin(c*x^n),x, algorithm="giac")
```

```
[Out] integrate(b*arcsin(c*x^n) + a, x)
```

Mupad [F(-1)]

Timed out.

$$\int (a + b \arcsin (cx^n)) \, dx = \int a + b \operatorname{asin}(c x^n) \, dx$$

```
[In] int(a + b*asin(c*x^n),x)
```

```
[Out] int(a + b*asin(c*x^n), x)
```

3.383 $\int \frac{a+b\arcsin(cx^n)}{x}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 75

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx=-\frac{ib\arcsin(cx^n)^2}{2n}+\frac{b\arcsin(cx^n)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n}+a\log(x)-\frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^n)}\right)}{2n}$$

```
[Out] -1/2*I*b*arcsin(c*x^n)^2/n+b*arcsin(c*x^n)*ln(1-(I*c*x^n+(1-c^2*(x^n)^2)^(1
/2))^2)/n+a*ln(x)-1/2*I*b*polylog(2,(I*c*x^n+(1-c^2*(x^n)^2)^(1/2))^2)/n
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {6874, 4914, 3798, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx=a\log(x)-\frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^n)}\right)}{2n}-\frac{ib\arcsin(cx^n)^2}{2n}+\frac{b\arcsin(cx^n)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n}$$

```
[In] Int[(a + b*ArcSin[c*x^n])/x,x]
```

```
[Out] ((-1/2*I)*b*ArcSin[c*x^n]^2)/n + (b*ArcSin[c*x^n]*Log[1 - E^((2*I)*ArcSin[c
*x^n])])/n + a*Log[x] - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x^n])])/n
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4914

```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Dist[1/p, Subst[Int[x^
n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{a}{x}+\frac{b\arcsin\left(cx^n\right)}{x}\right)dx \\
&= a\log(x)+b\int \frac{\arcsin\left(cx^n\right)}{x}\,dx \\
&= a\log(x)+\frac{b\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin\left(cx^n\right)\right)}{n} \\
&= -\frac{ib\arcsin\left(cx^n\right)^2}{2n}+a\log(x)-\frac{(2ib)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx,x,\arcsin\left(cx^n\right)\right)}{n}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{ib\arcsin\left(cx^n\right)^2}{2n} + \frac{b\arcsin\left(cx^n\right)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n} \\
&\quad + a\log(x) - \frac{b\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(cx^n\right)\right)}{n} \\
&= -\frac{ib\arcsin\left(cx^n\right)^2}{2n} + \frac{b\arcsin\left(cx^n\right)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n} \\
&\quad + a\log(x) + \frac{(ib)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx^n)}\right)}{2n} \\
&= -\frac{ib\arcsin\left(cx^n\right)^2}{2n} + \frac{b\arcsin\left(cx^n\right)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n} \\
&\quad + a\log(x) - \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx^n)}\right)}{2n}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 157 vs. 2(75) = 150.

Time = 0.15 (sec) , antiderivative size = 157, normalized size of antiderivative = 2.09

$$
\int\frac{a+b\arcsin\left(cx^n\right)}{x}\,dx = a\log(x) + b\arcsin\left(cx^n\right)\log(x) - \frac{bc\left(\log(x)\log\left(\sqrt{-c^2}x^n+\sqrt{1-c^2x^{2n}}\right) + \frac{i\left(i\,\text{arcsinh}\left(\sqrt{-c^2}x^n\right)\log\left(1-e^{-2\text{arcsinh}\left(\sqrt{-c^2}x^n\right)}\right)-\frac{1}{2}i\left(-\text{arcsinh}\left(\sqrt{-c^2}x^{\cdots}\right.\right.\right.}{n}\right.}{\sqrt{-c^2}}
$$

```
[In] Integrate[(a + b*ArcSin[c*x^n])/x,x]
```

```
[Out] a*Log[x] + b*ArcSin[c*x^n]*Log[x] - (b*c*(Log[x]*Log[Sqrt[-c^2]*x^n + Sqrt[
1 - c^2*x^(2*n)]] + (I*(I*ArcSinh[Sqrt[-c^2]*x^n]*Log[1 - E^(-2*ArcSinh[Sqr
t[-c^2]*x^n])] - (I/2)*(-ArcSinh[Sqrt[-c^2]*x^n]^2 + PolyLog[2, E^(-2*ArcSi
nh[Sqrt[-c^2]*x^n])])))/n))/Sqrt[-c^2]
```

Maple [A] (verified)

Time = 0.97 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.91

method	result
parts	$a\ln\left(x\right)+\frac{b\left(-\frac{i\arcsin\left(c\,x^{n}\right)^{2}}{2}+\arcsin\left(c\,x^{n}\right)\ln\left(1+ic\,x^{n}+\sqrt{1-c^{2}x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-ic\,x^{n}-\sqrt{1-c^{2}x^{2n}}\right)+\arcsin\left(c\,x^{n}\right)\right.}{n}$
derivativedivides	$\frac{a\ln\left(c\,x^{n}\right)+b\left(-\frac{i\arcsin\left(c\,x^{n}\right)^{2}}{2}+\arcsin\left(c\,x^{n}\right)\ln\left(1+ic\,x^{n}+\sqrt{1-c^{2}x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-ic\,x^{n}-\sqrt{1-c^{2}x^{2n}}\right)+\arcsin\left(c\,x^{n}\right)\ln\right.}{n}$
default	$\frac{a\ln\left(c\,x^{n}\right)+b\left(-\frac{i\arcsin\left(c\,x^{n}\right)^{2}}{2}+\arcsin\left(c\,x^{n}\right)\ln\left(1+ic\,x^{n}+\sqrt{1-c^{2}x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-ic\,x^{n}-\sqrt{1-c^{2}x^{2n}}\right)+\arcsin\left(c\,x^{n}\right)\ln\right.}{n}$

```
[In] int((a+b*arcsin(c*x^n))/x,x,method=_RETURNVERBOSE)
[Out] a*ln(x)+b/n*(-1/2*I*arcsin(c*x^n)^2+arcsin(c*x^n)*ln(1+I*c*x^n+(1-c^2*(x^n)
^2)^(1/2))-I*polylog(2,-I*c*x^n-(1-c^2*(x^n)^2)^(1/2))+arcsin(c*x^n)*ln(1-I
*c*x^n-(1-c^2*(x^n)^2)^(1/2))-I*polylog(2,I*c*x^n+(1-c^2*(x^n)^2)^(1/2)))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x^n))/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx^{n}\right)}{x}\,dx$$

```
[In] integrate((a+b*asin(c*x**n))/x,x)
[Out] Integral((a + b*asin(c*x**n))/x, x)
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx^n)}{x} \, dx = \int \frac{b \arcsin(cx^n) + a}{x} \, dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] (c*n*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n*log(x)/(c^2*x*x^(2*n) -
 x), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1))*log(x))*b + a*lo
g(x)
```

Giac [F]

$$\int \frac{a + b \arcsin(cx^n)}{x} \, dx = \int \frac{b \arcsin(cx^n) + a}{x} \, dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^n) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^n)}{x} \, dx = \int \frac{a + b \operatorname{asin}(c\,x^n)}{x} \, dx$$

```
[In] int((a + b*asin(c*x^n))/x,x)
```

```
[Out] int((a + b*asin(c*x^n))/x, x)
```

3.384 $\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 69

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx = -\frac{a+b\arcsin(cx^n)}{x} - \frac{bcnx^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{1-n}{2n},\frac{1}{2}\left(3-\frac{1}{n}\right),c^2x^{2n}\right)}{1-n}$$

```
[Out] (-a-b*arcsin(c*x^n))/x-b*c*n*x^(-1+n)*hypergeom([1/2, 1/2*(-1+n)/n],[3/2-1/
2/n],c^2*x^(2*n))/(1-n)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 371}

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx = -\frac{a+b\arcsin(cx^n)}{x} - \frac{bcnx^{n-1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{1-n}{2n},\frac{1}{2}\left(3-\frac{1}{n}\right),c^2x^{2n}\right)}{1-n}$$

```
[In] Int[(a + b*ArcSin[c*x^n])/x^2,x]
```

```
[Out] -((a + b*ArcSin[c*x^n])/x) - (b*c*n*x^(-1 + n)*Hypergeometric2F1[1/2, -1/2*
(1 - n)/n, (3 - n^(-1))/2, c^2*x^(2*n)])/(1 - n)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(cx^n\right)}{x}+b\int\frac{cnx^{-2+n}}{\sqrt{1-c^2x^{2n}}}\,dx \\
&= -\frac{a+b\arcsin\left(cx^n\right)}{x}+(bcn)\int\frac{x^{-2+n}}{\sqrt{1-c^2x^{2n}}}\,dx \\
&= -\frac{a+b\arcsin\left(cx^n\right)}{x}-\frac{bcnx^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{1-n}{2n},\frac{1}{2}\left(3-\frac{1}{n}\right),c^2x^{2n}\right)}{1-n}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.99

$$\int\frac{a+b\arcsin\left(cx^n\right)}{x^2}\,dx=-\frac{a}{x}-\frac{b\arcsin\left(cx^n\right)}{x}+\frac{bcnx^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{-1+n}{2n},1+\frac{-1+n}{2n},c^2x^{2n}\right)}{-1+n}$$

```
[In] Integrate[(a + b*ArcSin[c*x^n])/x^2,x]
```

```
[Out] -(a/x) - (b*ArcSin[c*x^n])/x + (b*c*n*x^(-1 + n)*Hypergeometric2F1[1/2, (-1
 + n)/(2*n), 1 + (-1 + n)/(2*n), c^2*x^(2*n)])/(-1 + n)
```

Maple [F]

$$\int \frac{a+b\arcsin\left(c\,x^{n}\right)}{x^{2}}dx$$

[In] int((a+b*arcsin(c*x^n))/x^2,x)

[Out] int((a+b*arcsin(c*x^n))/x^2,x)

Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (has polynomial part)

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.27 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.06

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{2}}\,dx = -\frac{a}{x}-\frac{ibcc^{-\frac{1}{n}}c^{-1+\frac{1}{n}}\Gamma\left(-\frac{1}{2n}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{1}{2n}\\1+\frac{1}{2n}\end{matrix}\middle|\frac{x^{-2n}}{c^{2}}\right)}{2x\Gamma\left(1-\frac{1}{2n}\right)}-\frac{b\,\mathrm{asin}\left(cx^{n}\right)}{x}$$

[In] integrate((a+b*asin(c*x**n))/x**2,x)

[Out] -a/x - I*b*c*c**(-1 + 1/n)*gamma(-1/(2*n))*hyper((1/2, 1/(2*n)), (1 + 1/(2*
n),), 1/(c**2*x**(2*n)))/(2*c**(1/n)*x*gamma(1 - 1/(2*n))) - b*asin(c*x**n)
/x

Maxima [F]

$$\int \frac{a + b\arcsin\left(cx^n\right)}{x^2}\,dx = \int \frac{b\arcsin\left(cx^n\right) + a}{x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -(c*n*x*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^2*x^(2*n) - x
^2), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b/x - a/x
```

Giac [F]

$$\int \frac{a + b\arcsin\left(cx^n\right)}{x^2}\,dx = \int \frac{b\arcsin\left(cx^n\right) + a}{x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^n) + a)/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin\left(cx^n\right)}{x^2}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x^n)}{x^2}\,dx$$

```
[In] int((a + b*asin(c*x^n))/x^2,x)
```

```
[Out] int((a + b*asin(c*x^n))/x^2, x)
```

3.385 $\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 72

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx=-\frac{a+b\arcsin(cx^n)}{2x^2}-\frac{bcnx^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}\left(1-\frac{2}{n}\right),\frac{1}{2}\left(3-\frac{2}{n}\right),c^2x^{2n}\right)}{2(2-n)}$$

```
[Out] 1/2*(-a-b*arcsin(c*x^n))/x^2-1/2*b*c*n*x^(-2+n)*hypergeom([1/2, 1/2-1/n],[3
/2-1/n],c^2*x^(2*n))/(2-n)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4926, 12, 371}

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx=-\frac{a+b\arcsin(cx^n)}{2x^2}-\frac{bcnx^{n-2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}\left(1-\frac{2}{n}\right),\frac{1}{2}\left(3-\frac{2}{n}\right),c^2x^{2n}\right)}{2(2-n)}$$

```
[In] Int[(a + b*ArcSin[c*x^n])/x^3,x]
```

```
[Out] -1/2*(a + b*ArcSin[c*x^n])/x^2 - (b*c*n*x^(-2 + n)*Hypergeometric2F1[1/2, (
1 - 2/n)/2, (3 - 2/n)/2, c^2*x^(2*n)])/(2*(2 - n))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] && !FunctionOfQ[(c + d*x)^(m + 1), u, x] && !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{a+b\arcsin(cx^n)}{2x^2}+\frac{1}{2}b\int\frac{cnx^{-3+n}}{\sqrt{1-c^2x^{2n}}}\,dx\\ &= -\frac{a+b\arcsin(cx^n)}{2x^2}+\frac{1}{2}(bcn)\int\frac{x^{-3+n}}{\sqrt{1-c^2x^{2n}}}\,dx\\ &= -\frac{a+b\arcsin(cx^n)}{2x^2}-\frac{bcnx^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}\left(1-\frac{2}{n}\right),\frac{1}{2}\left(3-\frac{2}{n}\right),c^2x^{2n}\right)}{2(2-n)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.04

$$\int\frac{a+b\arcsin(cx^n)}{x^3}\,dx=-\frac{a}{2x^2}-\frac{b\arcsin(cx^n)}{2x^2}+\frac{bcnx^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{-2+n}{2n},1+\frac{-2+n}{2n},c^2x^{2n}\right)}{2(-2+n)}$$

```
[In] Integrate[(a + b*ArcSin[c*x^n])/x^3,x]
```

```
[Out] -1/2*a/x^2 - (b*ArcSin[c*x^n])/(2*x^2) + (b*c*n*x^(-2 + n)*Hypergeometric2F
1[1/2, (-2 + n)/(2*n), 1 + (-2 + n)/(2*n), c^2*x^(2*n)])/(2*(-2 + n))
```

Maple [F]

$$\int \frac{a+b\arcsin\left(c\,x^{n}\right)}{x^{3}}dx$$

```
[In] int((a+b*arcsin(c*x^n))/x^3,x)
```

```
[Out] int((a+b*arcsin(c*x^n))/x^3,x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{3}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 4.23 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.04

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{3}}\,dx = -\frac{a}{2x^{2}} - \frac{ibcc^{-\frac{2}{n}}c^{-1+\frac{2}{n}}\Gamma\left(-\frac{1}{n}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|\frac{x^{-2n}}{c^{2}}\right)}{4x^{2}\Gamma\left(1-\frac{1}{n}\right)} - \frac{b\,\mathrm{asin}\left(cx^{n}\right)}{2x^{2}}$$

```
[In] integrate((a+b*asin(c*x**n))/x**3,x)
```

```
[Out] -a/(2*x**2) - I*b*c*c**(-1 + 2/n)*gamma(-1/n)*hyper((1/2, 1/n), (1 + 1/n,),
 1/(c**2*x**(2*n)))/(4*c**(2/n)*x**2*gamma(1 - 1/n)) - b*asin(c*x**n)/(2*x*
*2)
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx^n)}{x^3} \, dx = \int \frac{b \arcsin(cx^n) + a}{x^3} \, dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(2*c*n*x^2*integrate(1/2*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^3
*x^(2*n) - x^3), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b/x
^2 - 1/2*a/x^2
```

Giac [F]

$$\int \frac{a + b \arcsin(cx^n)}{x^3} \, dx = \int \frac{b \arcsin(cx^n) + a}{x^3} \, dx$$

```
[In] integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x^n) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx^n)}{x^3} \, dx = \int \frac{a + b \operatorname{asin}(c x^n)}{x^3} \, dx$$

```
[In] int((a + b*asin(c*x^n))/x^3,x)
```

```
[Out] int((a + b*asin(c*x^n))/x^3, x)
```

3.386 $\int x^5(a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 129

$$\int x^5(a+b\arcsin(c+dx^2))\,dx=\frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{b(4+11c^2-5cdx^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}{36d^3}+\frac{bc(3+2c^2)\arcsin(c+dx^2)}{12d^3}+\frac{1}{6}x^6(a+b\arcsin(c+dx^2))$$

```
[Out] 1/12*b*c*(2*c^2+3)*arcsin(d*x^2+c)/d^3+1/6*x^6*(a+b*arcsin(d*x^2+c))+1/18*b
*x^4*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d+1/36*b*(-5*c*d*x^2+11*c^2+4)*(-d^2*
x^4-2*c*d*x^2-c^2+1)^(1/2)/d^3
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4926, 12, 1128, 756, 793, 633, 222}

$$\int x^5(a+b\arcsin(c+dx^2))\,dx=\frac{1}{6}x^6(a+b\arcsin(c+dx^2))+\frac{bc(2c^2+3)\arcsin(c+dx^2)}{12d^3}+\frac{bx^4\sqrt{-c^2-2cdx^2-d^2x^4+1}}{18d}+\frac{b(11c^2-5cdx^2+4)\sqrt{-c^2-2cdx^2-d^2x^4+1}}{36d^3}$$

```
[In] Int[x^5*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (b*x^4*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(18*d) + (b*(4 + 11*c^2 - 5*c*d
*x^2)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(36*d^3) + (b*c*(3 + 2*c^2)*ArcS
in[c + d*x^2])/(12*d^3) + (x^6*(a + b*ArcSin[c + d*x^2]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 756

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*((a + b*x + c*x^2)^(p + 1)/(c*(m + 2*p +
 1))), x] + Dist[1/(c*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m +
 2*p + 1) - e*(a*e*(m - 1) + b*d*(p + 1)) + e*(2*c*d - b*e)*(m + p)*x, x]*(
a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && NeQ[b^2 -
4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && NeQ[2*c*d - b*e, 0] && If[Rat
ionalQ[m], GtQ[m, 1], SumSimplerQ[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuad
raticQ[a, b, c, d, e, m, p, x]
```

Rule 793

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Dist[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3)), Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c,
 d, e, f, g, p}, x] && NeQ[b^2 - 4*a*c, 0] &&  !LeQ[p, -1]
```

Rule 1128

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Dis
t[1/2, Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{6}b\int\frac{2dx^7}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{3}(bd)\int\frac{x^7}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{6}(bd)\text{Subst}\left(\int\frac{x^3}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)\\
&= \frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad+\frac{b\text{Subst}\left(\int\frac{x(-2(1-c^2)+5cdx)}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{18d}\\
&= \frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{b(4+11c^2-5cdx^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}{36d^3}\\
&\quad+\frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)+\frac{(bc(3+2c^2))\,\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{12d^2}\\
&= \frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{b(4+11c^2-5cdx^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}{36d^3}\\
&\quad+\frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{(bc(3+2c^2))\,\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{4d^2}}}\,dx,x,-2d(c+dx^2)\right)}{24d^4}\\
&= \frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{b(4+11c^2-5cdx^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}{36d^3}\\
&\quad+\frac{bc(3+2c^2)\arcsin\left(c+dx^2\right)}{12d^3}+\frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.90

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{ax^6}{6}+\frac{1}{2}b\left(\frac{4+11c^2}{18d^3}-\frac{5cx^2}{18d^2}+\frac{x^4}{9d}\right)\sqrt{1-c^2-2cdx^2-d^2x^4}+\frac{bc(3+2c^2)\arcsin\left(c+dx^2\right)}{12d^3}+\frac{1}{6}bx^6\arcsin\left(c+dx^2\right)$$

```
[In] Integrate[x^5*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (a*x^6)/6 + (b*((4 + 11*c^2)/(18*d^3) - (5*c*x^2)/(18*d^2) + x^4/(9*d))*Sqr
t[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/2 + (b*c*(3 + 2*c^2)*ArcSin[c + d*x^2])/(
12*d^3) + (b*x^6*ArcSin[c + d*x^2])/6
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 257 vs. 2(117) = 234.

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 2.00

method	result
default	$\frac{a\,x^6}{6}+b\left(\frac{x^6\arcsin\left(d\,x^2+c\right)}{6}-\frac{d\left(-\frac{x^4\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{6d^2}+\frac{5c\,x^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^3}-\frac{11c^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^4}-\frac{c^3\arctan}{}\right.}{3}\right.$
parts	$\frac{a\,x^6}{6}+b\left(\frac{x^6\arcsin\left(d\,x^2+c\right)}{6}-\frac{d\left(-\frac{x^4\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{6d^2}+\frac{5c\,x^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^3}-\frac{11c^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^4}-\frac{c^3\arctan}{}\right.}{3}\right.$

```
[In] int(x^5*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a*x^6+b*(1/6*x^6*arcsin(d*x^2+c)-1/3*d*(-1/6*x^4/d^2*(-d^2*x^4-2*c*d*x^
2-c^2+1)^(1/2)+5/12*c/d^3*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-11/12*c^2/d^
4*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-1/2*c^3/d^3/(d^2)^(1/2)*arctan((d^2)^(1/
2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-3/4*c/d^3/(d^2)^(1/2)*arctan
((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-1/3/d^4*(-d^2*x^4-
2*c*d*x^2-c^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.75

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=\frac{6\,ad^3x^6+3\,(2\,bd^3x^6+2\,bc^3+3\,bc)\arcsin\left(dx^2+c\right)+(2\,bd^2x^4-5\,bcdx^2+11\,bc^2+4\,b)\sqrt{-d^2x^4-2\,cdx^2-}}{36\,d^3}$$

```
[In] integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*a*d^3*x^6 + 3*(2*b*d^3*x^6 + 2*b*c^3 + 3*b*c)*arcsin(d*x^2 + c) + (
2*b*d^2*x^4 - 5*b*c*d*x^2 + 11*b*c^2 + 4*b)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2
 + 1))/d^3
```

Sympy [A] (verification not implemented)

Time = 0.57 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.58

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=\begin{cases}\frac{ax^6}{6}+\frac{bc^3\operatorname{asin}\left(c+dx^2\right)}{6d^3}+\frac{11bc^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{36d^3}-\frac{5bcx^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{36d^2}+\frac{bc\operatorname{asin}\left(c+dx^2\right)}{4d^3}+\frac{bx^6\operatorname{asin}\left(c+dx^2\right)}{6}+\frac{bx^4\sqrt{}}{} \\ \frac{x^6(a+b\operatorname{asin}(c))}{6}\end{cases}$$

```
[In] integrate(x**5*(a+b*asin(d*x**2+c)),x)
```

```
[Out] Piecewise((a*x**6/6 + b*c**3*asin(c + d*x**2)/(6*d**3) + 11*b*c**2*sqrt(-c*
*2 - 2*c*d*x**2 - d**2*x**4 + 1)/(36*d**3) - 5*b*c*x**2*sqrt(-c**2 - 2*c*d*
x**2 - d**2*x**4 + 1)/(36*d**2) + b*c*asin(c + d*x**2)/(4*d**3) + b*x**6*as
in(c + d*x**2)/6 + b*x**4*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(18*d) +
 b*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(9*d**3), Ne(d, 0)), (x**6*(a +
 b*asin(c))/6, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 245 vs. 2(117) = 234.

Time = 0.27 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.90

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{1}{6}\,ax^6$$
$$+\frac{1}{36}\left(6\,x^6\arcsin\left(dx^2+c\right)+\left(\frac{2\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}x^4}{d^2}-\frac{5\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}cx^2}{d^3}-\frac{15\,c^3}{}\right.\right.$$

```
[In] integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

```
[Out] 1/6*a*x^6 + 1/36*(6*x^6*arcsin(d*x^2 + c) + (2*sqrt(-d^2*x^4 - 2*c*d*x^2 -
c^2 + 1)*x^4/d^2 - 5*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*c*x^2/d^3 - 15*c^
3*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 9*(c^2 - 1)*
c*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2
*x^4 - 2*c*d*x^2 - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1
)*(c^2 - 1)/d^4)*d)*b
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 254 vs. $2(117) = 234$.

Time = 0.28 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.97

$$\begin{aligned}
&\int x^5(a + b\arcsin(c + dx^2))\,dx \\
&= \frac{(dx^2+c)^3 a}{6\,d^3} + \frac{(dx^2+c)\left((dx^2+c)^2-1\right)b\arcsin(dx^2+c)}{6\,d^3} \\
&\quad - \frac{\left((dx^2+c)^2-1\right)bc\arcsin(dx^2+c)}{2\,d^3} - \frac{(dx^2+c)\sqrt{-(dx^2+c)^2+1}bc}{4\,d^3} \\
&\quad - \frac{\left((dx^2+c)^2-1\right)ac}{2\,d^3} + \frac{(dx^2+c)b\arcsin(dx^2+c)}{6\,d^3} \\
&\quad - \frac{bc\arcsin(dx^2+c)}{4\,d^3} - \frac{\left(-(dx^2+c)^2+1\right)^{\frac{3}{2}}b}{18\,d^3} + \frac{\sqrt{-(dx^2+c)^2+1}b}{6\,d^3} \\
&\quad + \frac{(dx^2+c)ac^2 + \left((dx^2+c)\arcsin(dx^2+c) + \sqrt{-(dx^2+c)^2+1}\right)bc^2}{2\,d^3}
\end{aligned}$$

```
[In] integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

```
[Out] 1/6*(d*x^2 + c)^3*a/d^3 + 1/6*(d*x^2 + c)*((d*x^2 + c)^2 - 1)*b*arcsin(d*x^
2 + c)/d^3 - 1/2*((d*x^2 + c)^2 - 1)*b*c*arcsin(d*x^2 + c)/d^3 - 1/4*(d*x^2
 + c)*sqrt(-(d*x^2 + c)^2 + 1)*b*c/d^3 - 1/2*((d*x^2 + c)^2 - 1)*a*c/d^3 +
1/6*(d*x^2 + c)*b*arcsin(d*x^2 + c)/d^3 - 1/4*b*c*arcsin(d*x^2 + c)/d^3 - 1
/18*(-(d*x^2 + c)^2 + 1)^(3/2)*b/d^3 + 1/6*sqrt(-(d*x^2 + c)^2 + 1)*b/d^3 +
 1/2*((d*x^2 + c)*a*c^2 + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c
)^2 + 1))*b*c^2)/d^3
```

Mupad [F(-1)]

Timed out.

$$\int x^5(a+b\arcsin(c+dx^2))\,dx=\int x^5\,\left(a+b\,\mathrm{asin}\left(d\,x^2+c\right)\right)\,dx$$

```
[In] int(x^5*(a + b*asin(c + d*x^2)),x)
[Out] int(x^5*(a + b*asin(c + d*x^2)), x)
```

3.387 $\int x^3(a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 115

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=-\frac{3bc\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d^2}+\frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}-\frac{b(1+2c^2)\arcsin\left(c+dx^2\right)}{8d^2}+\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)$$

```
[Out] -1/8*b*(2*c^2+1)*arcsin(d*x^2+c)/d^2+1/4*x^4*(a+b*arcsin(d*x^2+c))-3/8*b*c*
(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2+1/8*b*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(
1/2)/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4926, 12, 1128, 756, 654, 633, 222}

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{b(2c^2+1)\arcsin\left(c+dx^2\right)}{8d^2}+\frac{bx^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d}-\frac{3bc\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d^2}$$

```
[In] Int[x^3*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (-3*b*c*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(8*d^2) + (b*x^2*Sqrt[1 - c^2
- 2*c*d*x^2 - d^2*x^4])/(8*d) - (b*(1 + 2*c^2)*ArcSin[c + d*x^2])/(8*d^2) +
 (x^4*(a + b*ArcSin[c + d*x^2]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 654

```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[e*((a + b*x + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[(2*c*d - b
*e)/(2*c), Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
&& NeQ[2*c*d - b*e, 0] && NeQ[p, -1]
```

Rule 756

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*((a + b*x + c*x^2)^(p + 1)/(c*(m + 2*p +
 1))), x] + Dist[1/(c*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m +
 2*p + 1) - e*(a*e*(m - 1) + b*d*(p + 1)) + e*(2*c*d - b*e)*(m + p)*x, x]*(
a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && NeQ[b^2 -
4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && NeQ[2*c*d - b*e, 0] && If[Rat
ionalQ[m], GtQ[m, 1], SumSimplerQ[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuad
raticQ[a, b, c, d, e, m, p, x]
```

Rule 1128

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Dis
t[1/2, Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
```

```
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{4}b\int\frac{2dx^5}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{2}(bd)\int\frac{x^5}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{4}(bd)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)\\
&= \frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}+\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad+\frac{b\text{Subst}\left(\int\frac{-1+c^2+3cdx}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{8d}\\
&= -\frac{3bc\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d^2}+\frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}\\
&\quad+\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{\left(b\left(1+2c^2\right)\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{8d}\\
&= -\frac{3bc\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d^2}+\frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}\\
&\quad+\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)+\frac{\left(b\left(1+2c^2\right)\right)\text{Subst}\left(\int\frac{1}{\sqrt{1-\frac{x^2}{4d^2}}}\,dx,x,-2d\left(c+dx^2\right)\right)}{16d^3}\\
&= -\frac{3bc\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d^2}+\frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}\\
&\quad-\frac{b\left(1+2c^2\right)\arcsin\left(c+dx^2\right)}{8d^2}+\frac{1}{4}x^4\left(a+b\arcsin\left(c+dx^2\right)\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.85

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{ax^4}{4}+\frac{1}{2}b\left(-\frac{3c}{4d^2}+\frac{x^2}{4d}\right)\sqrt{1-c^2-2cdx^2-d^2x^4}-\frac{b\left(1+2c^2\right)\arcsin\left(c+dx^2\right)}{8d^2}+\frac{1}{4}bx^4\arcsin\left(c+dx^2\right)$$

```
[In] Integrate[x^3*(a + b*ArcSin[c + d*x^2]),x]
[Out] (a*x^4)/4 + (b*((-3*c)/(4*d^2) + x^2/(4*d))*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*
x^4])/2 - (b*(1 + 2*c^2)*ArcSin[c + d*x^2])/(8*d^2) + (b*x^4*ArcSin[c + d*x
^2])/4
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.66

method	result
default	$\frac{a\,x^{4}}{4}+\frac{b\,x^{4}\arcsin\left(d\,x^{2}+c\right)}{4}+\frac{b\,x^{2}\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}{8d}-\frac{3bc\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}{8d^{2}}-\frac{b\,c^{2}\arctan\left(\frac{\sqrt{d^{2}}\,\left(x^{2}+\frac{c}{d}\right)}{\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}\right)}{4d\sqrt{d^{2}}}$
parts	$\frac{a\,x^{4}}{4}+\frac{b\,x^{4}\arcsin\left(d\,x^{2}+c\right)}{4}+\frac{b\,x^{2}\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}{8d}-\frac{3bc\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}{8d^{2}}-\frac{b\,c^{2}\arctan\left(\frac{\sqrt{d^{2}}\,\left(x^{2}+\frac{c}{d}\right)}{\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}\right)}{4d\sqrt{d^{2}}}$

```
[In] int(x^3*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
[Out] 1/4*a*x^4+1/4*b*x^4*arcsin(d*x^2+c)+1/8*b*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1
/2)/d-3/8*b*c*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2-1/4*b*c^2/d/(d^2)^(1/2)*
arctan((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-1/8*b/d/(d^2
)^(1/2)*arctan((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.69

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \frac{2\,ad^2x^4+\left(2\,bd^2x^4-2\,bc^2-b\right)\arcsin\left(dx^2+c\right)+\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(bdx^2-3\,bc)}{8\,d^2}$$

```
[In] integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
[Out] 1/8*(2*a*d^2*x^4 + (2*b*d^2*x^4 - 2*b*c^2 - b)*arcsin(d*x^2 + c) + sqrt(-d^
2*x^4 - 2*c*d*x^2 - c^2 + 1)*(b*d*x^2 - 3*b*c))/d^2
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.16

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \begin{cases} \frac{ax^4}{4}-\frac{bc^2\operatorname{asin}\left(c+dx^2\right)}{4d^2}-\frac{3bc\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d^2}+\frac{bx^4\operatorname{asin}\left(c+dx^2\right)}{4}+\frac{bx^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d}-\frac{b\operatorname{asin}\left(c+dx^2\right)}{8d^2} & \text{for } d \neq 0 \\ \frac{x^4(a+b\operatorname{asin}\left(c\right))}{4} & \text{otherwise} \end{cases}$$

```
[In] integrate(x**3*(a+b*asin(d*x**2+c)),x)
```

```
[Out] Piecewise((a*x**4/4 - b*c**2*asin(c + d*x**2)/(4*d**2) - 3*b*c*sqrt(-c**2 -
 2*c*d*x**2 - d**2*x**4 + 1)/(8*d**2) + b*x**4*asin(c + d*x**2)/4 + b*x**2*
sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(8*d) - b*asin(c + d*x**2)/(8*d**2
), Ne(d, 0)), (x**4*(a + b*asin(c))/4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.51

$$\int x^3(a+b\arcsin(c+dx^2))\,dx = \frac{1}{4}ax^4 + \frac{1}{8}\left(2x^4\arcsin(dx^2+c) + d\left(\frac{\sqrt{-d^2x^4-2cdx^2-c^2+1}x^2}{d^2} + \frac{3c^2\arcsin\left(-\frac{d^2x^2+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} - \frac{(c^2-1)}{}\right.\right.$$

```
[In] integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4 + 1/8*(2*x^4*arcsin(d*x^2 + c) + d*(sqrt(-d^2*x^4 - 2*c*d*x^2 - c
^2 + 1)*x^2/d^2 + 3*c^2*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^
2))/d^3 - (c^2 - 1)*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/
d^3 - 3*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*c/d^3))*b
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.11

$$\int x^3(a+b\arcsin(c+dx^2))\,dx = -\frac{(dx^2+c)ac + \left((dx^2+c)\arcsin(dx^2+c) + \sqrt{-(dx^2+c)^2+1}\right)bc}{2d^2} + \frac{2\left((dx^2+c)^2-1\right)b\arcsin(dx^2+c) + (dx^2+c)\sqrt{-(dx^2+c)^2+1}b + 2\left((dx^2+c)^2-1\right)a + b\arcsin(}{8d^2}$$

```
[In] integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

```
[Out] -1/2*((d*x^2 + c)*a*c + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)^
2 + 1))*b*c)/d^2 + 1/8*(2*((d*x^2 + c)^2 - 1)*b*arcsin(d*x^2 + c) + (d*x^2
+ c)*sqrt(-(d*x^2 + c)^2 + 1)*b + 2*((d*x^2 + c)^2 - 1)*a + b*arcsin(d*x^2
+ c))/d^2
```

Mupad [F(-1)]

Timed out.

$$\int x^3(a + b \arcsin(c + dx^2)) \, dx = \int x^3 \left(a + b \operatorname{asin}\left(d x^2 + c\right)\right) \, dx$$

```
[In] int(x^3*(a + b*asin(c + d*x^2)),x)
[Out] int(x^3*(a + b*asin(c + d*x^2)), x)
```

3.388 $\int x(a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 57

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{ax^2}{2}+\frac{b\sqrt{1-\left(c+dx^2\right)^2}}{2d}+\frac{b(c+dx^2)\arcsin\left(c+dx^2\right)}{2d}$$

```
[Out] 1/2*a*x^2+1/2*b*(d*x^2+c)*arcsin(d*x^2+c)/d+1/2*b*(1-(d*x^2+c)^2)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {6847, 4887, 4715, 267}

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{ax^2}{2}+\frac{b(c+dx^2)\arcsin\left(c+dx^2\right)}{2d}+\frac{b\sqrt{1-\left(c+dx^2\right)^2}}{2d}$$

```
[In] Int[x*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (a*x^2)/2 + (b*Sqrt[1 - (c + d*x^2)^2])/(2*d) + (b*(c + d*x^2)*ArcSin[c + d
*x^2])/(2*d)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{2}\text{Subst}\left(\int (a+b\arcsin(c+dx))\,dx, x, x^2\right)\\
&= \frac{ax^2}{2}+\frac{1}{2}b\text{Subst}\left(\int \arcsin(c+dx)\,dx, x, x^2\right)\\
&= \frac{ax^2}{2}+\frac{b\text{Subst}\left(\int \arcsin(x)\,dx, x, c+dx^2\right)}{2d}\\
&= \frac{ax^2}{2}+\frac{b(c+dx^2)\arcsin\left(c+dx^2\right)}{2d}-\frac{b\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, c+dx^2\right)}{2d}\\
&= \frac{ax^2}{2}+\frac{b\sqrt{1-(c+dx^2)^2}}{2d}+\frac{b(c+dx^2)\arcsin\left(c+dx^2\right)}{2d}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 183 vs. 2(57) = 114.

Time = 0.10 (sec) , antiderivative size = 183, normalized size of antiderivative = 3.21

$$
\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \frac{ax^2}{2}+\frac{1}{2}bx^2\arcsin\left(c+dx^2\right) + \frac{b\left(2d\sqrt{1-c^2-2cdx^2-d^2x^4}+2cd\arctan\left(\frac{\sqrt{-d^2}x^2-\sqrt{1-c^2-2cdx^2-d^2x^4}}{c}\right)+c\sqrt{-d^2}\log\left(-1+2cdx^2+2d^2x^4\right.\right.}{4d^2}
$$

```
[In] Integrate[x*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (a*x^2)/2 + (b*x^2*ArcSin[c + d*x^2])/2 + (b*(2*d*Sqrt[1 - c^2 - 2*c*d*x^2
- d^2*x^4] + 2*c*d*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*
x^4])/c] + c*Sqrt[-d^2]*Log[-1 + 2*c*d*x^2 + 2*d^2*x^4 + 2*Sqrt[-d^2]*x^2*S
qrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]]))/(4*d^2)
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.81

method	result	size
parts	$\frac{a\,x^{2}}{2}+\frac{b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$	46
derivativedivides	$\frac{\left(d\,x^{2}+c\right)a+b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$	50
default	$\frac{\left(d\,x^{2}+c\right)a+b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$	50

```
[In] int(x*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
[Out] 1/2*a*x^2+1/2*b/d*((d*x^2+c)*arcsin(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \frac{adx^2+\left(bdx^2+bc\right)\arcsin\left(dx^2+c\right)+\sqrt{-d^2x^4-2\,cdx^2-c^2+1}b}{2\,d}$$

```
[In] integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
[Out] 1/2*(a*d*x^2 + (b*d*x^2 + b*c)*arcsin(d*x^2 + c) + sqrt(-d^2*x^4 - 2*c*d*x^
2 - c^2 + 1)*b)/d
```

Sympy [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.33

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \begin{cases} \frac{ax^2}{2}+\frac{bc\,\mathrm{asin}\left(c+dx^2\right)}{2d}+\frac{bx^2\,\mathrm{asin}\left(c+dx^2\right)}{2}+\frac{b\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d} & \text{for } d\neq 0 \\ \frac{x^2(a+b\,\mathrm{asin}\,(c))}{2} & \text{otherwise} \end{cases}$$

```
[In] integrate(x*(a+b*asin(d*x**2+c)),x)
```

```
[Out] Piecewise((a*x**2/2 + b*c*asin(c + d*x**2)/(2*d) + b*x**2*asin(c + d*x**2)/
2 + b*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(2*d), Ne(d, 0)), (x**2*(a +
 b*asin(c))/2, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.79

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \frac{1}{2}\,ax^2+\frac{\left((dx^2+c)\arcsin\left(dx^2+c\right)+\sqrt{-(dx^2+c)^2+1}\right)b}{2\,d}$$

```
[In] integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

```
[Out] 1/2*a*x^2 + 1/2*((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)^2 + 1))*
b/d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.86

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = \frac{(dx^2+c)a+\left((dx^2+c)\arcsin\left(dx^2+c\right)+\sqrt{-(dx^2+c)^2+1}\right)b}{2\,d}$$

```
[In] integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

```
[Out] 1/2*((d*x^2 + c)*a + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)^2 +
 1))*b)/d
```

Mupad [B] (verification not implemented)

Time = 0.79 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.89

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{a\,x^2}{2}+\frac{b\,x^2\,\mathrm{asin}(d\,x^2+c)}{2}+\frac{b\,\sqrt{-c^2-2\,c\,d\,x^2-d^2\,x^4+1}}{2\,d}+\frac{b\,c\,\ln\left(\sqrt{-c^2-2\,c\,d\,x^2-d^2\,x^4+1}-\frac{d^2\,x^2+c\,d}{\sqrt{-d^2}}\right)}{2\,\sqrt{-d^2}}$$

```
[In] int(x*(a + b*asin(c + d*x^2)),x)
```

```
[Out] (a*x^2)/2 + (b*x^2*asin(c + d*x^2))/2 + (b*(1 - d^2*x^4 - 2*c*d*x^2 - c^2)^
(1/2))/(2*d) + (b*c*log((1 - d^2*x^4 - 2*c*d*x^2 - c^2)^(1/2) - (c*d + d^2*
x^2)/(-d^2)^(1/2)))/(2*(-d^2)^(1/2))
```

3.389 $\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 214

$$\begin{aligned}\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = & -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 \\ & +\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) \\ & +\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right) \\ & +a\log(x)-\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) \\ & -\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right)\end{aligned}$$

```
[Out] -1/4*I*b*arcsin(d*x^2+c)^2+a*ln(x)+1/2*b*arcsin(d*x^2+c)*ln(1-(I*(d*x^2+c)+
(1-(d*x^2+c)^2)^(1/2))/(I*c-(-c^2+1)^(1/2)))+1/2*b*arcsin(d*x^2+c)*ln(1-(I*
(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c+(-c^2+1)^(1/2)))-1/2*I*b*polylog(2,(I
*(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c-(-c^2+1)^(1/2)))-1/2*I*b*polylog(2,(
I*(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c+(-c^2+1)^(1/2)))
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {6874, 4889, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = a\log(x)-\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(dx^2+c)}}{ic-\sqrt{1-c^2}}\right)-\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(dx^2+c)}}{ic+\sqrt{1-c^2}}\right)+\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{-\sqrt{1-c^2}+ic}\right)+\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{\sqrt{1-c^2}+ic}\right)-\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x,x]
```

```
[Out] (-1/4*I)*b*ArcSin[c + d*x^2]^2 + (b*ArcSin[c + d*x^2]*Log[1 - E^(I*ArcSin[c
 + d*x^2])/(I*c - Sqrt[1 - c^2])])/2 + (b*ArcSin[c + d*x^2]*Log[1 - E^(I*Ar
cSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])])/2 + a*Log[x] - (I/2)*b*PolyLog[2,
E^(I*ArcSin[c + d*x^2])/(I*c - Sqrt[1 - c^2])] - (I/2)*b*PolyLog[2, E^(I*Ar
cSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4889

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*Ar
cSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a}{x}+\frac{b \arcsin\left(c+dx^2\right)}{x}\right) dx\\
&= a\log(x)+b\int \frac{\arcsin\left(c+dx^2\right)}{x}\,dx\\
&= a\log(x)+\frac{1}{2}b\text{Subst}\left(\int \frac{\arcsin(c+dx)}{x}\,dx,x,x^2\right)\\
&= a\log(x)+\frac{b\text{Subst}\left(\int \frac{\arcsin(x)}{-\frac{c}{d}+\frac{x}{d}}\,dx,x,c+dx^2\right)}{2d}\\
&= a\log(x)+\frac{b\text{Subst}\left(\int \frac{x\cos(x)}{-\frac{c}{d}+\frac{\sin(x)}{d}}\,dx,x,\arcsin\left(c+dx^2\right)\right)}{2d}
\end{aligned}$$

$$= -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 + a\log(x) + \frac{(ib)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{ic}{d}-\frac{\sqrt{1-c^2}}{d}+\frac{e^{ix}}{d}}\,dx, x, \arcsin\left(c+dx^2\right)\right)}{2d} + \frac{(ib)\text{Subst}\left(\int \frac{e^{ix}x}{-\frac{ic}{d}+\frac{\sqrt{1-c^2}}{d}+\frac{e^{ix}}{d}}\,dx, x, \arcsin\left(c+dx^2\right)\right)}{2d}$$

$$= -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin\left(c+dx^2\right)}}{ic-\sqrt{1-c^2}}\right) + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin\left(c+dx^2\right)}}{ic+\sqrt{1-c^2}}\right) + a\log(x) - \frac{1}{2}b\text{Subst}\left(\int \log\left(1+\frac{e^{ix}}{\left(-\frac{ic}{d}-\frac{\sqrt{1-c^2}}{d}\right)d}\right)dx, x, \arcsin\left(c+dx^2\right)\right) - \frac{1}{2}b\text{Subst}\left(\int \log\left(1+\frac{e^{ix}}{\left(-\frac{ic}{d}+\frac{\sqrt{1-c^2}}{d}\right)d}\right)dx, x, \arcsin\left(c+dx^2\right)\right)$$

$$= -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin\left(c+dx^2\right)}}{ic-\sqrt{1-c^2}}\right) + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin\left(c+dx^2\right)}}{ic+\sqrt{1-c^2}}\right) + a\log(x) + \frac{1}{2}(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{\left(-\frac{ic}{d}-\frac{\sqrt{1-c^2}}{d}\right)d}\right)}{x}dx, x, e^{i\arcsin\left(c+dx^2\right)}\right) + \frac{1}{2}(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{\left(-\frac{ic}{d}+\frac{\sqrt{1-c^2}}{d}\right)d}\right)}{x}dx, x, e^{i\arcsin\left(c+dx^2\right)}\right)$$

$$= -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) + \frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right) + a\log(x) - \frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) - \frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right)$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.03

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x}\,dx = a\log(x) + \frac{1}{2}b\left(-\frac{1}{2}i\arcsin\left(c+dx^2\right)^2 + \arcsin\left(c+dx^2\right)\log\left(1+\frac{e^{i\arcsin(c+dx^2)}}{\left(-\frac{ic}{d}-\frac{\sqrt{1-c^2}}{d}\right)d}\right) + \arcsin\left(c+dx^2\right)\log\left(1+\frac{e^{i\arcsin(c+dx^2)}}{\left(-\frac{ic}{d}+\frac{\sqrt{1-c^2}}{d}\right)d}\right) - i\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(c+dx^2)}}{-ic+\sqrt{1-c^2}}\right) - i\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right)\right)$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x,x]
```

```
[Out] a*Log[x] + (b*((-1/2*I)*ArcSin[c + d*x^2]^2 + ArcSin[c + d*x^2]*Log[1 + E^(
I*ArcSin[c + d*x^2])/((((-I)*c)/d - Sqrt[1 - c^2]/d)*d)] + ArcSin[c + d*x^2
]*Log[1 + E^(I*ArcSin[c + d*x^2])/((((-I)*c)/d + Sqrt[1 - c^2]/d)*d)] - I*P
olyLog[2, -(E^(I*ArcSin[c + d*x^2])/((-I)*c + Sqrt[1 - c^2]))] - I*PolyLog[
2, E^(I*ArcSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])]))/2
```

Maple [F]

$$\int \frac{a+b\arcsin\left(d\,x^{2}+c\right)}{x}dx$$

```
[In] int((a+b*arcsin(d*x^2+c))/x,x)
[Out] int((a+b*arcsin(d*x^2+c))/x,x)
```

Fricas [F]

$$\int \frac{a+b\arcsin\left(c+dx^{2}\right)}{x}\,dx=\int \frac{b\arcsin\left(dx^{2}+c\right)+a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x^2 + c) + a)/x, x)
```

Sympy [F]

$$\int \frac{a+b\arcsin\left(c+dx^{2}\right)}{x}\,dx=\int \frac{a+b\,\mathrm{asin}\left(c+dx^{2}\right)}{x}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x,x)
[Out] Integral((a + b*asin(c + d*x**2))/x, x)
```

Maxima [F]

$$\int \frac{a+b\arcsin\left(c+dx^{2}\right)}{x}\,dx=\int \frac{b\arcsin\left(dx^{2}+c\right)+a}{x}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="maxima")
[Out] b*integrate(arctan2(d*x^2 + c, sqrt(d*x^2 + c + 1)*sqrt(-d*x^2 - c + 1))/x,
 x) + a*log(x)
```

Giac [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx^2)}{x} \, dx = \int \frac{a + b \operatorname{asin}(d x^2 + c)}{x} \, dx$$

```
[In] int((a + b*asin(c + d*x^2))/x,x)
[Out] int((a + b*asin(c + d*x^2))/x, x)
```

3.390 $\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 90

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = -\frac{a+b\arcsin(c+dx^2)}{2x^2} - \frac{bd\,\text{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{2\sqrt{1-c^2}}$$

```
[Out] 1/2*(-a-b*arcsin(d*x^2+c))/x^2-1/2*b*d*arctanh((-c*d*x^2-c^2+1)/(-c^2+1)^(1
/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4926, 12, 1128, 738, 212}

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = -\frac{a+b\arcsin(c+dx^2)}{2x^2} - \frac{bd\,\text{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{2\sqrt{1-c^2}}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^3,x]
```

```
[Out] -1/2*(a + b*ArcSin[c + d*x^2])/x^2 - (b*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt
[1 - c^2]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(2*Sqrt[1 - c^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 738

```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Dist[-2, Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (2
*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c,
 d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 1128

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Dis
t[1/2, Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(c+dx^2\right)}{2x^2}+\frac{1}{2}b\int\frac{2d}{x\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{2x^2}+(bd)\int\frac{1}{x\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{2x^2}+\frac{1}{2}(bd)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{2x^2}-(bd)\text{Subst}\left(\int\frac{1}{4\left(1-c^2\right)-x^2}\,dx,x,\frac{2(1-c^2-cdx^2)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{2x^2}-\frac{bd\text{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{2\sqrt{1-c^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \frac{1}{2}\left(-\frac{a+b\arcsin(c+dx^2)}{x^2}-\frac{bd\operatorname{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-(c+dx^2)^2}}\right)}{\sqrt{1-c^2}}\right)$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^3,x]
[Out] (-((a + b*ArcSin[c + d*x^2])/x^2) - (b*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt[
1 - c^2]*Sqrt[1 - (c + d*x^2)^2])])/Sqrt[1 - c^2])/2
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.99

method	result	size
default	$-\frac{a}{2x^2}-\frac{b\arcsin(d\,x^2+c)}{2x^2}-\frac{bd\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{2\sqrt{-c^2+1}}$	89
parts	$-\frac{a}{2x^2}-\frac{b\arcsin(d\,x^2+c)}{2x^2}-\frac{bd\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{2\sqrt{-c^2+1}}$	89

```
[In] int((a+b*arcsin(d*x^2+c))/x^3,x,method=_RETURNVERBOSE)
[Out] -1/2*a/x^2-1/2*b/x^2*arcsin(d*x^2+c)-1/2*b*d/(-c^2+1)^(1/2)*ln((-2*c^2+2-2*
c*d*x^2+2*(-c^2+1)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 280, normalized size of antiderivative = 3.11

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \left[-\frac{\sqrt{-c^2+1}bdx^2\log\left(\frac{(2c^2-1)d^2x^4+2c^4+4(c^3-c)dx^2+2\sqrt{-d^2x^4-2cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{-c^2+1}-4c^2+2}{x^4}\right)+2ac^2+2(}{4(c^2-1)x^2}\right.$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="fricas")
[Out] [-1/4*(sqrt(-c^2 + 1)*b*d*x^2*log(((2*c^2 - 1)*d^2*x^4 + 2*c^4 + 4*(c^3 - c
)*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt(-
```

```
c^2 + 1) - 4*c^2 + 2)/x^4) + 2*a*c^2 + 2*(b*c^2 - b)*arcsin(d*x^2 + c) - 2*
a)/((c^2 - 1)*x^2), 1/2*(sqrt(c^2 - 1)*b*d*x^2*arctan(sqrt(-d^2*x^4 - 2*c*d
*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt(c^2 - 1)/((c^2 - 1)*d^2*x^4 + c^4
+ 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)) - a*c^2 - (b*c^2 - b)*arcsin(d*x^2 + c) +
 a)/((c^2 - 1)*x^2)]
```

Sympy [F]

$$\int \frac{a + b \arcsin (c + dx^2)}{x^3} \, dx = \int \frac{a + b \operatorname{asin} (c + dx^2)}{x^3} \, dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**3,x)
[Out] Integral((a + b*asin(c + d*x**2))/x**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin (c + dx^2)}{x^3} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a + b \arcsin (c + dx^2)}{x^3} \, dx = \int \frac{b \arcsin (dx^2 + c) + a}{x^3} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^3}\,dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^3,x)
[Out] int((a + b*asin(c + d*x^2))/x^3, x)
```

3.391 $\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 137

$$\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx = -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)x^2} - \frac{a+b\arcsin(c+dx^2)}{4x^4} - \frac{bcd^2\operatorname{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{4(1-c^2)^{3/2}}$$

```
[Out] 1/4*(-a-b*arcsin(d*x^2+c))/x^4-1/4*b*c*d^2*arctanh((-c*d*x^2-c^2+1)/(-c^2+1
)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(3/2)-1/4*b*d*(-d^2*x^4-
2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4926, 12, 1128, 744, 738, 212}

$$\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx = -\frac{a+b\arcsin(c+dx^2)}{4x^4} - \frac{bcd^2\operatorname{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{4(1-c^2)^{3/2}} - \frac{bd\sqrt{-c^2-2cdx^2-d^2x^4+1}}{4(1-c^2)x^2}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^5,x]
```

```
[Out] -1/4*(b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/((1 - c^2)*x^2) - (a + b*Arc
Sin[c + d*x^2])/(4*x^4) - (b*c*d^2*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt[1 - c^
2]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(4*(1 - c^2)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 738

```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Dist[-2, Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (2
*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c,
 d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 744

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m + 1)*((a + b*x + c*x^2)^(p + 1)/((m + 1)*(c*d
^2 - b*d*e + a*e^2))), x] + Dist[(2*c*d - b*e)/(2*(c*d^2 - b*d*e + a*e^2)),
 Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e,
 m, p}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && NeQ[2
*c*d - b*e, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 1128

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Dis
t[1/2, Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}+\frac{1}{4}b\int\frac{2d}{x^3\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx$$

$$= -\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}+\frac{1}{2}(bd)\int\frac{1}{x^3\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx$$

$$= -\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}+\frac{1}{4}(bd)\text{Subst}\left(\int\frac{1}{x^2\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4\left(1-c^2\right)x^2}-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}+\frac{\left(bcd^2\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{4\left(1-c^2\right)}$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4\left(1-c^2\right)x^2}-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}-\frac{\left(bcd^2\right)\text{Subst}\left(\int\frac{1}{4(1-c^2)-x^2}\,dx,x,\frac{2\left(1-c^2-cdx^2\right)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{2\left(1-c^2\right)}$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4\left(1-c^2\right)x^2}-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}-\frac{bcd^2\text{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{4\left(1-c^2\right)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.08

$$\int\frac{a+b\arcsin\left(c+dx^2\right)}{x^5}\,dx = -\frac{a}{4x^4}+\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4\left(-1+c^2\right)x^2}-\frac{b\arcsin\left(c+dx^2\right)}{4x^4}+\frac{bcd^2\arctan\left(\frac{\sqrt{-d^2}x^2-\sqrt{1-c^2-2cdx^2-d^2x^4}}{\sqrt{-1+c^2}}\right)}{2(-1+c)(1+c)\sqrt{-1+c^2}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^5,x]
```

```
[Out] -1/4*a/x^4 + (b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(4*(-1 + c^2)*x^2) -
 (b*ArcSin[c + d*x^2])/(4*x^4) + (b*c*d^2*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1 -
 c^2 - 2*c*d*x^2 - d^2*x^4])/Sqrt[-1 + c^2]])/(2*(-1 + c)*(1 + c)*Sqrt[-1 +
 c^2])
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.96

method	result	size
default	$-\frac{a}{4x^4}-\frac{b\arcsin\left(d\,x^2+c\right)}{4x^4}-\frac{bd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^2}-\frac{b\,d^2c\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{4(-c^2+1)^{\frac{3}{2}}}$	132
parts	$-\frac{a}{4x^4}-\frac{b\arcsin\left(d\,x^2+c\right)}{4x^4}-\frac{bd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^2}-\frac{b\,d^2c\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{4(-c^2+1)^{\frac{3}{2}}}$	132

```
[In] int((a+b*arcsin(d*x^2+c))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/x^4-1/4*b/x^4*arcsin(d*x^2+c)-1/4*b*d*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/
2)/(-c^2+1)/x^2-1/4*b*d^2*c/(-c^2+1)^(3/2)*ln((-2*c^2+2-2*c*d*x^2+2*(-c^2+1
)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 392, normalized size of antiderivative = 2.86

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^5}\,dx = \left[-\frac{\sqrt{-c^2+1}bcd^2x^4\log\left(\frac{(2\,c^2-1)d^2x^4+2\,c^4+4\,(c^3-c)dx^2-2\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{-c^2+1}-4\,c^2+2}{x^4}\right)+2\,ac^4-}{8\,(c^4-2\,c^2+1}\right.$$

$$-\frac{\sqrt{c^2-1}bcd^2x^4\arctan\left(\frac{\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{c^2-1}}{(c^2-1)d^2x^4+c^4+2\,(c^3-c)dx^2-2\,c^2+1}\right)+ac^4-\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(bc^2-b)}{4\,(c^4-2\,c^2+1)x^4}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="fricas")
```

```
[Out] [-1/8*(sqrt(-c^2 + 1)*b*c*d^2*x^4*log(((2*c^2 - 1)*d^2*x^4 + 2*c^4 + 4*(c^3
 - c)*d*x^2 - 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sq
rt(-c^2 + 1) - 4*c^2 + 2)/x^4) + 2*a*c^4 - 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^
2 + 1)*(b*c^2 - b)*d*x^2 - 4*a*c^2 + 2*(b*c^4 - 2*b*c^2 + b)*arcsin(d*x^2 +
 c) + 2*a)/((c^4 - 2*c^2 + 1)*x^4), -1/4*(sqrt(c^2 - 1)*b*c*d^2*x^4*arctan(
sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt(c^2 - 1)/((c^
2 - 1)*d^2*x^4 + c^4 + 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)) + a*c^4 - sqrt(-d^2*
x^4 - 2*c*d*x^2 - c^2 + 1)*(b*c^2 - b)*d*x^2 - 2*a*c^2 + (b*c^4 - 2*b*c^2 +
 b)*arcsin(d*x^2 + c) + a)/((c^4 - 2*c^2 + 1)*x^4)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^5} \, dx = \int \frac{a + b \operatorname{asin}(c + dx^2)}{x^5} \, dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**5,x)
```

```
[Out] Integral((a + b*asin(c + d*x**2))/x**5, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^5} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^5} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x^5} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^5, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^5} \, dx = \int \frac{a + b \operatorname{asin}(d x^2 + c)}{x^5} \, dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^5,x)
```

```
[Out] int((a + b*asin(c + d*x^2))/x^5, x)
```

3.392 $\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 190

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx = -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12(1-c^2)x^4} - \frac{bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)^2x^2} - \frac{a+b\arcsin(c+dx^2)}{6x^6} - \frac{b(1+2c^2)d^3\operatorname{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{12(1-c^2)^{5/2}}$$

```
[Out] 1/6*(-a-b*arcsin(d*x^2+c))/x^6-1/12*b*(2*c^2+1)*d^3*arctanh((-c*d*x^2-c^2+1
)/(-c^2+1)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(5/2)-1/12*b*d*
(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^4-1/4*b*c*d^2*(-d^2*x^4-2*c*d*x
^2-c^2+1)^(1/2)/(-c^2+1)^2/x^2
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {4926, 12, 1128, 758, 820, 738, 212}

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx = -\frac{a+b\arcsin(c+dx^2)}{6x^6} - \frac{b(2c^2+1)\,d^3\text{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{12(1-c^2)^{5/2}} - \frac{bcd^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{4(1-c^2)^2x^2} - \frac{bd\sqrt{-c^2-2cdx^2-d^2x^4+1}}{12(1-c^2)x^4}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^7,x]
```

```
[Out] -1/12*(b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/((1 - c^2)*x^4) - (b*c*d^2*
Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(4*(1 - c^2)^2*x^2) - (a + b*ArcSin[c
+ d*x^2])/(6*x^6) - (b*(1 + 2*c^2)*d^3*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt[1
- c^2]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(12*(1 - c^2)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 738

```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Dist[-2, Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (2
*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c,
 d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 758

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m + 1)*((a + b*x + c*x^2)^(p + 1)/((m + 1)*(c*d
^2 - b*d*e + a*e^2))), x] + Dist[1/((m + 1)*(c*d^2 - b*d*e + a*e^2)), Int[(
```

```
d + e*x)^(m + 1)*Simp[c*d*(m + 1) - b*e*(m + p + 2) - c*e*(m + 2*p + 3)*x,
x]*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && NeQ[b^
2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && NeQ[2*c*d - b*e, 0] && Ne
Q[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, b, c, d, e, m, p, x]) || (SumS
implerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[m + 2*p + 3], 0])
```

Rule 820

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Dist[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2)), Int[(d + e*x)^(
m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x]
 && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && EqQ[Simplify[m
+ 2*p + 3], 0]
```

Rule 1128

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Dis
t[1/2, Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}+\frac{1}{6}b\int\frac{2d}{x^5\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}+\frac{1}{3}(bd)\int\frac{1}{x^5\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}+\frac{1}{6}(bd)\text{Subst}\left(\int\frac{1}{x^3\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)\\
&= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12\left(1-c^2\right)x^4}-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}\\
&\quad-\frac{(bd)\text{Subst}\left(\int\frac{-3cd-d^2x}{x^2\sqrt{1-c^2-2cdx-d^2x^2}}\,dx,x,x^2\right)}{12\left(1-c^2\right)}
\end{aligned}$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12(1-c^2)x^4} - \frac{bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)^2x^2} - \frac{a+b\arcsin(c+dx^2)}{6x^6} + \frac{(b(1+2c^2)d^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2-2cdx-d^2x^2}}\,dx, x, x^2\right)}{12(1-c^2)^2}$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12(1-c^2)x^4} - \frac{bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)^2x^2} - \frac{a+b\arcsin(c+dx^2)}{6x^6} - \frac{(b(1+2c^2)d^3)\,\text{Subst}\left(\int \frac{1}{4(1-c^2)-x^2}\,dx, x, \frac{2(1-c^2-cdx^2)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{6(1-c^2)^2}$$

$$= -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12(1-c^2)x^4} - \frac{bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)^2x^2} - \frac{a+b\arcsin(c+dx^2)}{6x^6} - \frac{b(1+2c^2)d^3\text{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{12(1-c^2)^{5/2}}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 174, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx = -\frac{a}{6x^6} + b\left(\frac{d}{12(-1+c^2)x^4} - \frac{cd^2}{4(-1+c^2)^2x^2}\right)\sqrt{1-c^2-2cdx^2-d^2x^4} - \frac{b\arcsin(c+dx^2)}{6x^6} - \frac{b(1+2c^2)d^3\arctan\left(\frac{\sqrt{-d^2}x^2-\sqrt{1-c^2-2cdx^2-d^2x^4}}{\sqrt{-1+c^2}}\right)}{6(-1+c)^2(1+c)^2\sqrt{-1+c^2}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^7,x]
```

```
[Out] -1/6*a/x^6 + b*(d/(12*(-1 + c^2)*x^4) - (c*d^2)/(4*(-1 + c^2)^2*x^2))*Sqrt[
1 - c^2 - 2*c*d*x^2 - d^2*x^4] - (b*ArcSin[c + d*x^2])/(6*x^6) - (b*(1 + 2*
c^2)*d^3*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/Sqrt
[-1 + c^2]])/(6*(-1 + c)^2*(1 + c)^2*Sqrt[-1 + c^2])
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.29

method	result
default	$-\frac{a}{6x^6}+b\left(-\frac{\arcsin(d\,x^2+c)}{6x^6}+\frac{d\left(-\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^4}-\frac{3dc\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)^2x^2}-\frac{3d^2c^2\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-}}{x^2}\right.}{4(-c^2+1)^{\frac{5}{2}}}\right.}{3}\right.$
parts	$-\frac{a}{6x^6}+b\left(-\frac{\arcsin(d\,x^2+c)}{6x^6}+\frac{d\left(-\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^4}-\frac{3dc\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)^2x^2}-\frac{3d^2c^2\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-}}{x^2}\right.}{4(-c^2+1)^{\frac{5}{2}}}\right.}{3}\right.$

```
[In] int((a+b*arcsin(d*x^2+c))/x^7,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a/x^6+b*(-1/6/x^6*arcsin(d*x^2+c)+1/3*d*(-1/4/(-c^2+1)/x^4*(-d^2*x^4-2
*c*d*x^2-c^2+1)^(1/2)-3/4*d*c/(-c^2+1)^2/x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/
2)-3/4*d^2*c^2/(-c^2+1)^(5/2)*ln((-2*c^2+2-2*c*d*x^2+2*(-c^2+1)^(1/2)*(-d^2
*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)-1/4*d^2/(-c^2+1)^(3/2)*ln((-2*c^2+2-2*c*d
*x^2+2*(-c^2+1)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 496, normalized size of antiderivative = 2.61

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx$$
$$=\left[-\frac{(2\,bc^2+b)\sqrt{-c^2+1}d^3x^6\log\left(\frac{(2\,c^2-1)d^2x^4+2\,c^4+4\,(c^3-c)dx^2+2\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}\,(cdx^2+c^2-1)\sqrt{-c^2+1}-4\,c^2+2}{x^4}\right)+}{}\right.$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="fricas")
```

```
[Out] [-1/24*((2*b*c^2 + b)*sqrt(-c^2 + 1)*d^3*x^6*log(((2*c^2 - 1)*d^2*x^4 + 2*c
^4 + 4*(c^3 - c)*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 +
c^2 - 1)*sqrt(-c^2 + 1) - 4*c^2 + 2)/x^4) + 4*a*c^6 - 12*a*c^4 + 12*a*c^2 +
 4*(b*c^6 - 3*b*c^4 + 3*b*c^2 - b)*arcsin(d*x^2 + c) + 2*(3*(b*c^3 - b*c)*d
^2*x^4 - (b*c^4 - 2*b*c^2 + b)*d*x^2)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)
- 4*a)/((c^6 - 3*c^4 + 3*c^2 - 1)*x^6), 1/12*((2*b*c^2 + b)*sqrt(c^2 - 1)*d
^3*x^6*arctan(sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt
(c^2 - 1)/((c^2 - 1)*d^2*x^4 + c^4 + 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)) - 2*a*
```

```
c^6 + 6*a*c^4 - 6*a*c^2 - 2*(b*c^6 - 3*b*c^4 + 3*b*c^2 - b)*arcsin(d*x^2 +
c) - (3*(b*c^3 - b*c)*d^2*x^4 - (b*c^4 - 2*b*c^2 + b)*d*x^2)*sqrt(-d^2*x^4
- 2*c*d*x^2 - c^2 + 1) + 2*a)/((c^6 - 3*c^4 + 3*c^2 - 1)*x^6)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^7} \, dx = \int \frac{a + b \operatorname{asin}(c + dx^2)}{x^7} \, dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**7,x)
[Out] Integral((a + b*asin(c + d*x**2))/x**7, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^7} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^7} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x^7} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^7, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^7}\,dx=\int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^7}\,dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^7,x)
[Out] int((a + b*asin(c + d*x^2))/x^7, x)
```

3.393 $\int x^4(a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 336

$$\int x^4(a+b\arcsin(c+dx^2))\,dx = -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2} + \frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d} + \frac{1}{5}x^5(a+b\arcsin(c+dx^2)) - \frac{2b\sqrt{1-c}(1+c)(9+23c^2)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2b\sqrt{1-c}(1+c)(9+8c+15c^2)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[Out] 1/5*x^5*(a+b*arcsin(d*x^2+c))-2/75*b*(1+c)*(23*c^2+9)*EllipticE(x*d^(1/2)/(
1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2
/(1+c))^(1/2)/d^(5/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/75*b*(1+c)*(15*c^2
+8*c+9)*EllipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(
1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/d^(5/2)/(-d^2*x^4-2*c*d*x^2-c^2+
1)^(1/2)-16/75*b*c*x*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2+2/25*b*x^3*(-d^2*
x^4-2*c*d*x^2-c^2+1)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4926, 12, 1136, 1293, 1216, 538, 435, 430}

$$\begin{aligned}
&\int x^4\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx \\
&=\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right) \\
&\quad+\frac{2b\sqrt{1-c}(c+1)\left(15c^2+8c+9\right)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{75d^{5/2}\sqrt{-c^2-2cdx^2-d^2x^4+1}} \\
&\quad-\frac{2b\sqrt{1-c}(c+1)\left(23c^2+9\right)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{75d^{5/2}\sqrt{-c^2-2cdx^2-d^2x^4+1}} \\
&\quad-\frac{16bcx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{75d^2}+\frac{2bx^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{25d}
\end{aligned}$$

```
[In] Int[x^4*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (-16*b*c*x*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(75*d^2) + (2*b*x^3*Sqrt[1
- c^2 - 2*c*d*x^2 - d^2*x^4])/(25*d) + (x^5*(a + b*ArcSin[c + d*x^2]))/5 -
(2*b*Sqrt[1 - c]*(1 + c)*(9 + 23*c^2)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d
*x^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c)
)])/(75*d^(5/2)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) + (2*b*Sqrt[1 - c]*(1
+ c)*(9 + 8*c + 15*c^2)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]
*EllipticF[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(75*d^(5/2
)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 538

```
Int[((e_) + (f_.)*(x_)^(n_))/(Sqrt[(a_) + (b_.)*(x_)^(n_)]*Sqrt[(c_) + (d_.
)*(x_)^(n_)]), x_Symbol] :> Dist[f/b, Int[Sqrt[a + b*x^n]/Sqrt[c + d*x^n],
x], x] + Dist[(b*e - a*f)/b, Int[1/(Sqrt[a + b*x^n]*Sqrt[c + d*x^n]), x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] &&  !(EqQ[n, 2] && ((PosQ[b/a] && PosQ
[d/c]) || (NegQ[b/a] && (PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || Simpler
SqrtQ[-b/a, -d/c]))))))
```

Rule 1136

```
Int[((d_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
 :> Simp[d^3*(d*x)^(m - 3)*((a + b*x^2 + c*x^4)^(p + 1)/(c*(m + 4*p + 1))),
 x] - Dist[d^4/(c*(m + 4*p + 1)), Int[(d*x)^(m - 4)*Simp[a*(m - 3) + b*(m +
 2*p - 1)*x^2, x]*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x
] && NeQ[b^2 - 4*a*c, 0] && GtQ[m, 3] && NeQ[m + 4*p + 1, 0] && IntegerQ[2*
p] && (IntegerQ[p] || IntegerQ[m])
```

Rule 1216

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4]), Int[(d + e*x^2)/(Sqrt[1 +
 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c
, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

Rule 1293

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)*((a_) + (b_.)*(x_)^2 + (c_.)*(
x_)^4)^(p_), x_Symbol] :> Simp[e*f*(f*x)^(m - 1)*((a + b*x^2 + c*x^4)^(p +
1)/(c*(m + 4*p + 3))), x] - Dist[f^2/(c*(m + 4*p + 3)), Int[(f*x)^(m - 2)*(
a + b*x^2 + c*x^4)^p*Simp[a*e*(m - 1) + (b*e*(m + 2*p + 1) - c*d*(m + 4*p +
 3))*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && NeQ[b^2 - 4*a*c,
 0] && GtQ[m, 1] && NeQ[m + 4*p + 3, 0] && IntegerQ[2*p] && (IntegerQ[p] ||
 IntegerQ[m])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{5}b\int\frac{2dx^6}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{5}(2bd)\int\frac{x^6}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d}+\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{(2b)\int\frac{x^2\left(3\left(1-c^2\right)-8cdx^2\right)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{25d}\\
&= -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2}+\frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d}\\
&\quad+\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{(2b)\int\frac{-8c\left(1-c^2\right)d+\left(9+23c^2\right)d^2x^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{75d^3}\\
&= -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2}\\
&\quad+\frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d}+\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad-\frac{\left(2b\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{-8c\left(1-c^2\right)d+\left(9+23c^2\right)d^2x^2}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{75d^3\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&= -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2}\\
&\quad+\frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d}+\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad+\frac{\left(2b(1+c)\left(9+8c+15c^2\right)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{75d^2\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&\quad-\frac{\left(2b(1+c)\left(9+23c^2\right)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}}{\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{75d^2\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&= -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2}\\
&\quad+\frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d}+\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad-\frac{2b\sqrt{1-c}(1+c)\left(9+23c^2\right)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&\quad+\frac{2b\sqrt{1-c}(1+c)\left(9+8c+15c^2\right)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.04

$$\int x^4\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$

$$= \frac{\sqrt{\frac{d}{1+c}}x\left(15ad^2x^4\sqrt{1-c^2-2cdx^2-d^2x^4}+2b(-8c+8c^3+3dx^2+13c^2dx^2+2cd^2x^4-3d^3x^6)+15bd^2x^4\sqrt{}\right.}{}$$

[In] Integrate[x^4*(a + b*ArcSin[c + d*x^2]),x]

[Out] (Sqrt[d/(1 + c)]*x*(15*a*d^2*x^4*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] + 2*b*(-8*c + 8*c^3 + 3*d*x^2 + 13*c^2*d*x^2 + 2*c*d^2*x^4 - 3*d^3*x^6) + 15*b*d^2*x^4*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]*ArcSin[c + d*x^2]) + (2*I)*b*(-9 + 9*c - 23*c^2 + 23*c^3)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1 + c)] - (2*I)*b*(-9 + 17*c - 23*c^2 + 15*c^3)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1 + c)])/(75*d^2*Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])

Maple [A] (verified)

Time = 1.19 (sec) , antiderivative size = 346, normalized size of antiderivative = 1.03

method	result
default	$\frac{a\,x^5}{5}+b\left(\frac{x^5\arcsin\left(d\,x^2+c\right)}{5}-\frac{2d\left(-\frac{x^3\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{5d^2}+\frac{8cx\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{15d^3}-\frac{8c\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{EllipticF}}{15d^3\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2}}\right.}{}\right.$
parts	$\frac{a\,x^5}{5}+b\left(\frac{x^5\arcsin\left(d\,x^2+c\right)}{5}-\frac{2d\left(-\frac{x^3\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{5d^2}+\frac{8cx\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{15d^3}-\frac{8c\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{EllipticF}}{15d^3\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2}}\right.}{}\right.$

[In] int(x^4*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)

[Out] 1/5*a*x^5+b*(1/5*x^5*arcsin(d*x^2+c)-2/5*d*(-1/5*x^3/d^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+8/15*c/d^3*x*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-8/15*c/d^3*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/

```
2))-2*(1/5/d^2*(-3*c^2+3)+32/15*c^2/d^2)*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-
1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*
c*d+2*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(
-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

Fricas [A] (verification not implemented)

none

Time = 0.10 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.26

$$\int x^4 (a + b \arcsin (c + dx^2)) \, dx = \frac{15 \, bd^3x^6 \arcsin (dx^2 + c) + 15 \, ad^3x^6 + 2 \, (3 \, bd^2x^4 - 8 \, bcdx^2 + 23 \, bc^2 + 9 \, b)\sqrt{-d^2x^4 - 2 \, cdx^2 - c^2 + 1}}{75 \, d^3x}$$

```
[In] integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

```
[Out] 1/75*(15*b*d^3*x^6*arcsin(d*x^2 + c) + 15*a*d^3*x^6 + 2*(3*b*d^2*x^4 - 8*b*
c*d*x^2 + 23*b*c^2 + 9*b)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1))/(d^3*x)
```

Sympy [F]

$$\int x^4 (a + b \arcsin (c + dx^2)) \, dx = \int x^4 (a + b \operatorname{asin} (c + dx^2)) \, dx$$

```
[In] integrate(x**4*(a+b*asin(d*x**2+c)),x)
```

```
[Out] Integral(x**4*(a + b*asin(c + d*x**2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int x^4 (a + b \arcsin (c + dx^2)) \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int x^4 \left(a + b \arcsin \left(c + dx^2\right)\right) \, dx = \int \left(b \arcsin \left(dx^2 + c\right) + a\right) x^4 \, dx$$

```
[In] integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)*x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^4 \left(a + b \arcsin \left(c + dx^2\right)\right) \, dx = \int x^4 \left(a + b \operatorname{asin}\left(d x^2 + c\right)\right) \, dx$$

```
[In] int(x^4*(a + b*asin(c + d*x^2)),x)
[Out] int(x^4*(a + b*asin(c + d*x^2)), x)
```

3.394 $\int x^2(a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 287

$$\begin{aligned}\int x^2(a+b\arcsin(c+dx^2))\,dx &= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d}+\frac{1}{3}x^3(a+b\arcsin(c+dx^2))\\ &\quad+\frac{8b\sqrt{1-c}c(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)\middle|-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\\ &\quad-\frac{2b\sqrt{1-c}(1+c)(1+3c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\end{aligned}$$

```
[Out] 1/3*x^3*(a+b*arcsin(d*x^2+c))+8/9*b*c*(1+c)*EllipticE(x*d^(1/2)/(1-c)^(1/2)
,((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1
/2)/d^(3/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-2/9*b*(1+c)*(1+3*c)*EllipticF(
x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/
2)*(1+d*x^2/(1+c))^(1/2)/d^(3/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/9*b*x*(
-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used

= {4926, 12, 1136, 1216, 538, 435, 430}

$$\int x^2\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$

$$=\frac{1}{3}x^3\left(a+b\arcsin\left(c+dx^2\right)\right)$$
$$-\frac{2b\sqrt{1-c}(c+1)(3c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{9d^{3/2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}$$
$$+\frac{8b\sqrt{1-c}c(c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{9d^{3/2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}$$
$$+\frac{2bx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{9d}$$

```
[In] Int[x^2*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (2*b*x*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(9*d) + (x^3*(a + b*ArcSin[c +
d*x^2]))/3 + (8*b*Sqrt[1 - c]*c*(1 + c)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 +
(d*x^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 +
c))])/(9*d^(3/2)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) - (2*b*Sqrt[1 - c]*(1
 + c)*(1 + 3*c)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*Ellipti
cF[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(9*d^(3/2)*Sqrt[1
- c^2 - 2*c*d*x^2 - d^2*x^4])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 538

```
Int[((e_) + (f_.)*(x_)^(n_))/(Sqrt[(a_) + (b_.)*(x_)^(n_)]*Sqrt[(c_) + (d_.
)*(x_)^(n_)]), x_Symbol] :> Dist[f/b, Int[Sqrt[a + b*x^n]/Sqrt[c + d*x^n],
x], x] + Dist[(b*e - a*f)/b, Int[1/(Sqrt[a + b*x^n]*Sqrt[c + d*x^n]), x], x
```

```
] /; FreeQ[{a, b, c, d, e, f, n}, x] &&  !(EqQ[n, 2] && ((PosQ[b/a] && PosQ
[d/c]) || (NegQ[b/a] && (PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || Simpler
SqrtQ[-b/a, -d/c]))))))
```

Rule 1136

```
Int[((d_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
 :> Simp[d^3*(d*x)^(m - 3)*((a + b*x^2 + c*x^4)^(p + 1)/(c*(m + 4*p + 1))),
 x] - Dist[d^4/(c*(m + 4*p + 1)), Int[(d*x)^(m - 4)*Simp[a*(m - 3) + b*(m +
 2*p - 1)*x^2, x]*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x
] && NeQ[b^2 - 4*a*c, 0] && GtQ[m, 3] && NeQ[m + 4*p + 1, 0] && IntegerQ[2*
p] && (IntegerQ[p] || IntegerQ[m])
```

Rule 1216

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4]), Int[(d + e*x^2)/(Sqrt[1 +
 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c
, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}x^3\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{3}b\int\frac{2dx^4}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{1}{3}x^3\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{1}{3}(2bd)\int\frac{x^4}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d}+\frac{1}{3}x^3\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{(2b)\int\frac{1-c^2-4cdx^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{9d}\\
&= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d}+\frac{1}{3}x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\\
&\quad-\frac{\left(2b\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{1-c^2-4cdx^2}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{9d\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}$$

$$= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d} + \frac{1}{3}x^3(a+b\arcsin(c+dx^2)) + \frac{\left(8bc(1+c)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int \frac{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}}{\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{9d\sqrt{1-c^2-2cdx^2-d^2x^4}} - \frac{\left(2b(1+c)(1+3c)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int \frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{9d\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

$$= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d} + \frac{1}{3}x^3(a+b\arcsin(c+dx^2)) + \frac{8b\sqrt{1-c}c(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}} - \frac{2b\sqrt{1-c}(1+c)(1+3c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.37 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.07

$$\int x^2(a+b\arcsin(c+dx^2))\,dx$$

$$= \frac{\sqrt{\frac{d}{1+c}}x\left(3adx^2\sqrt{1-c^2-2cdx^2-d^2x^4}-2b(-1+c^2+2cdx^2+d^2x^4)+3bdx^2\sqrt{1-c^2-2cdx^2-d^2x^4}\,\text{arcs}\right.}{}$$

```
[In] Integrate[x^2*(a + b*ArcSin[c + d*x^2]),x]
```

```
[Out] (Sqrt[d/(1 + c)]*x*(3*a*d*x^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] - 2*b*(-1
 + c^2 + 2*c*d*x^2 + d^2*x^4) + 3*b*d*x^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^
4]*ArcSin[c + d*x^2]) - (8*I)*b*(-1 + c)*c*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*
Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 +
c)/(-1 + c)] + (2*I)*b*(1 - 4*c + 3*c^2)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sq
rt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)
/(-1 + c)])/(9*d*Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

Maple [A] (verified)

Time = 0.81 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.03

method	result
default	$\frac{x^3 a}{3}+b\left(\frac{x^3\arcsin\left(d\,x^2+c\right)}{3}-\frac{2d\left(-\frac{x\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3d^2}+\frac{\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\text{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{3d^2\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}+\cdots\right.}{\cdots}\right.$
parts	$\frac{x^3 a}{3}+b\left(\frac{x^3\arcsin\left(d\,x^2+c\right)}{3}-\frac{2d\left(-\frac{x\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3d^2}+\frac{\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\text{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{3d^2\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}+\cdots\right.}{\cdots}\right.$

```
[In] int(x^2*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*x^3*a+b*(1/3*x^3*arcsin(d*x^2+c)-2/3*d*(-1/3/d^2*x*(-d^2*x^4-2*c*d*x^2-
c^2+1)^(1/2)+1/3/d^2*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d
*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c))^
(1/2),(-1+2*c/(1+c))^(1/2))+8/3*c/d*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*
x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2
*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-
1+c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

Fricas [A] (verification not implemented)

none

Time = 0.09 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.25

$$\int x^2\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=\frac{3\,bd^2x^4\arcsin\left(dx^2+c\right)+3\,ad^2x^4+2\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(bdx^2-4\,bc)}{9\,d^2x}$$

```
[In] integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*b*d^2*x^4*arcsin(d*x^2 + c) + 3*a*d^2*x^4 + 2*sqrt(-d^2*x^4 - 2*c*d*
x^2 - c^2 + 1)*(b*d*x^2 - 4*b*c))/(d^2*x)
```

Sympy [F]

$$\int x^2(a+b\arcsin(c+dx^2))\,dx = \int x^2(a+b\,\mathrm{asin}\,(c+dx^2))\,dx$$

```
[In] integrate(x**2*(a+b*asin(d*x**2+c)),x)
```

```
[Out] Integral(x**2*(a + b*asin(c + d*x**2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int x^2(a+b\arcsin(c+dx^2))\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int x^2(a+b\arcsin(c+dx^2))\,dx = \int (b\arcsin(dx^2+c)+a)x^2\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 + c) + a)*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2(a+b\arcsin(c+dx^2))\,dx = \int x^2\,(a+b\,\mathrm{asin}(d\,x^2+c))\,dx$$

```
[In] int(x^2*(a + b*asin(c + d*x^2)),x)
```

```
[Out] int(x^2*(a + b*asin(c + d*x^2)), x)
```

3.395 $\int (a+b\arcsin(c+dx^2))\,dx$

Optimal result

Integrand size = 12, antiderivative size = 237

$$\int (a+b\arcsin(c+dx^2))\,dx = ax+bx\arcsin(c+dx^2)-\frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[Out] a*x+b*x*arcsin(d*x^2+c)-2*b*(1+c)*EllipticE(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(
1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/d^(1/2
)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2*b*(1+c)*EllipticF(x*d^(1/2)/(1-c)^(1/2
),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(
1/2)/d^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4924, 12, 1154, 507, 435, 430}

$$\int (a+b\arcsin(c+dx^2))\,dx = ax+\frac{2b\sqrt{1-c}(c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}\sqrt{-c^2-2cdx^2-d^2x^4+1}} - \frac{2b\sqrt{1-c}(c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{\sqrt{d}\sqrt{-c^2-2cdx^2-d^2x^4+1}}+bx\arcsin(c+dx^2)$$

```
[In] Int[a + b*ArcSin[c + d*x^2],x]
```

```
[Out] a*x + b*x*ArcSin[c + d*x^2] - (2*b*Sqrt[1 - c]*(1 + c)*Sqrt[1 - (d*x^2)/(1
- c)]*Sqrt[1 + (d*x^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]],
-((1 - c)/(1 + c))])/(Sqrt[d]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) + (2*b*S
qrt[1 - c]*(1 + c)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*Elli
pticF[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(Sqrt[d]*Sqrt[1
 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 507

```
Int[(x_)^(n_)/(Sqrt[(a_) + (b_.)*(x_)^(n_)]*Sqrt[(c_) + (d_.)*(x_)^(n_)]),
x_Symbol] :> Dist[1/b, Int[Sqrt[a + b*x^n]/Sqrt[c + d*x^n], x], x] - Dist[a
/b, Int[1/(Sqrt[a + b*x^n]*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d},
x] && NeQ[b*c - a*d, 0] && (EqQ[n, 2] || EqQ[n, 4]) &&  !(EqQ[n, 2] && Simp
lerSqrtQ[-b/a, -d/c])
```

Rule 1154

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbol] :> With[{q =
 Rt[b^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt[1 + 2*c*(x^2/(
b + q))]/Sqrt[a + b*x^2 + c*x^4]), Int[x^2/(Sqrt[1 + 2*c*(x^2/(b - q))]*Sqr
t[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*
c, 0] && NegQ[c/a]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
```

```
nOfExponentialQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= ax + b\int \arcsin\left(c+dx^2\right)\,dx\\
&= ax + bx\arcsin\left(c+dx^2\right) - b\int \frac{2dx^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= ax + bx\arcsin\left(c+dx^2\right) - (2bd)\int \frac{x^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= ax+bx\arcsin\left(c+dx^2\right) - \frac{\left(2bd\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int \frac{x^2}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&= ax + bx\arcsin\left(c+dx^2\right)\\
&\quad + \frac{\left(2b(1+c)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int \frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&\quad - \frac{\left(2b(1+c)\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int \frac{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}}{\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&= ax+bx\arcsin\left(c+dx^2\right) - \frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&\quad + \frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 10.10 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.65

$$
\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx = ax+bx\arcsin\left(c+dx^2\right) + \frac{2ib(-1+c)\sqrt{\frac{-1+c+dx^2}{-1+c}}\sqrt{\frac{1+c+dx^2}{1+c}}\left(E\left(i\text{arcsinh}\left(\sqrt{\frac{d}{1+c}}x\right)|\frac{1+c}{-1+c}\right)-\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{\frac{d}{1+c}}x\right),\frac{1+c}{-1+c}\right)\right)}{\sqrt{\frac{d}{1+c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}
$$

```
[In] Integrate[a + b*ArcSin[c + d*x^2],x]
```

[Out] a*x + b*x*ArcSin[c + d*x^2] + ((2*I)*b*(-1 + c)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*(EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1 + c)] - EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1 + c)]))/(Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])

Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.65

method	result
default	$ax+b\left(x\arcsin\left(d\,x^{2}+c\right)+\frac{4d\left(-c^{2}+1\right)\sqrt{1+\frac{d\,x^{2}}{-1+c}}\,\sqrt{1+\frac{d\,x^{2}}{1+c}}\,\left(\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\operatorname{EllipticE}\left(x\sqrt{-\frac{d}{-1+c}}\right.\right.}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}\,\left(-2cd+2d\right)}\right.$
parts	$ax+b\left(x\arcsin\left(d\,x^{2}+c\right)+\frac{4d\left(-c^{2}+1\right)\sqrt{1+\frac{d\,x^{2}}{-1+c}}\,\sqrt{1+\frac{d\,x^{2}}{1+c}}\,\left(\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\operatorname{EllipticE}\left(x\sqrt{-\frac{d}{-1+c}}\right.\right.}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}\,\left(-2cd+2d\right)}\right.$

[In] int(a+b*arcsin(d*x^2+c),x,method=_RETURNVERBOSE)

[Out] a*x+b*(x*arcsin(d*x^2+c)+4*d*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))))

Fricas [A] (verification not implemented)

none

Time = 0.09 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.23

$$\int\left(a+b\arcsin\left(c+dx^{2}\right)\right)\,dx=\frac{bdx^{2}\arcsin\left(dx^{2}+c\right)+adx^{2}+2\sqrt{-d^{2}x^{4}-2\,cdx^{2}-c^{2}+1}b}{dx}$$

[In] integrate(a+b*arcsin(d*x^2+c),x, algorithm="fricas")

[Out] (b*d*x^2*arcsin(d*x^2 + c) + a*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*b)/(d*x)

Sympy [F]

$$\int \left(a + b \arcsin\left(c + dx^2\right)\right) \, dx = \int \left(a + b \operatorname{asin}\left(c + dx^2\right)\right) \, dx$$

```
[In] integrate(a+b*asin(d*x**2+c),x)
[Out] Integral(a + b*asin(c + d*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a + b \arcsin\left(c + dx^2\right)\right) \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate(a+b*arcsin(d*x^2+c),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \left(a + b \arcsin\left(c + dx^2\right)\right) \, dx = \int b \arcsin\left(dx^2 + c\right) + a \, dx$$

```
[In] integrate(a+b*arcsin(d*x^2+c),x, algorithm="giac")
[Out] integrate(b*arcsin(d*x^2 + c) + a, x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a + b \arcsin\left(c + dx^2\right)\right) \, dx = \int a + b \operatorname{asin}\left(d\,x^2 + c\right) \, dx$$

```
[In] int(a + b*asin(c + d*x^2),x)
[Out] int(a + b*asin(c + d*x^2), x)
```

3.396 $\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 126

$$\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx = -\frac{a+b\arcsin(c+dx^2)}{x} + \frac{2b\sqrt{1-c}\sqrt{d}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[Out] (-a-b*arcsin(d*x^2+c))/x+2*b*EllipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))
^(1/2))*(1-c)^(1/2)*d^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d
^2*x^4-2*c*d*x^2-c^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4926, 12, 1118, 430}

$$\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx = \frac{2b\sqrt{1-c}\sqrt{d}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{-c^2-2cdx^2-d^2x^4+1}} - \frac{a+b\arcsin(c+dx^2)}{x}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^2,x]
```

```
[Out] -((a + b*ArcSin[c + d*x^2])/x) + (2*b*Sqrt[1 - c]*Sqrt[d]*Sqrt[1 - (d*x^2)/
(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*EllipticF[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]
], -((1 - c)/(1 + c))])/Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 1118

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbol] :> With[{q = Rt[b
^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt[1 + 2*c*(x^2/(b + q
))]/Sqrt[a + b*x^2 + c*x^4]), Int[1/(Sqrt[1 + 2*c*(x^2/(b - q))]*Sqrt[1 + 2
*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] &
& NegQ[c/a]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(c+dx^2\right)}{x}+b\int\frac{2d}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{x}+(2bd)\int\frac{1}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{x}+\frac{\left(2bd\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{x}+\frac{2b\sqrt{1-c}\sqrt{d}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.11

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^2}\,dx = -\frac{a}{x}-\frac{b\arcsin\left(c+dx^2\right)}{x} - \frac{2ibd\sqrt{1-\frac{dx^2}{-1-c}}\sqrt{1-\frac{dx^2}{1-c}}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right),\frac{-1-c}{1-c}\right)}{\sqrt{-\frac{d}{-1-c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^2,x]
```

```
[Out] -(a/x) - (b*ArcSin[c + d*x^2])/x - ((2*I)*b*d*Sqrt[1 - (d*x^2)/(-1 - c)]*Sq
rt[1 - (d*x^2)/(1 - c)]*EllipticF[I*ArcSinh[Sqrt[-(d/(-1 - c))]*x], (-1 - c
)/(1 - c)])/(Sqrt[-(d/(-1 - c))]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.90

method	result	size
default	$-\frac{a}{x}+b\left(-\frac{\arcsin\left(d\,x^2+c\right)}{x}+\frac{2d\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\text{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}\right)$	114
parts	$-\frac{a}{x}+b\left(-\frac{\arcsin\left(d\,x^2+c\right)}{x}+\frac{2d\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\text{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}\right)$	114

```
[In] int((a+b*arcsin(d*x^2+c))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/x+b*(-1/x*arcsin(d*x^2+c)+2*d/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(
1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c
))^(1/2),(-1+2*c/(1+c))^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.14 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.13

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2}\,dx = -\frac{b\arcsin(dx^2 + c) + a}{x}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="fricas")
[Out] -(b*arcsin(d*x^2 + c) + a)/x
```

Sympy [F]

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2}\,dx = \int \frac{a + b\,\mathrm{asin}(c + dx^2)}{x^2}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**2,x)
[Out] Integral((a + b*asin(c + d*x**2))/x**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2}\,dx = \int \frac{b\arcsin(dx^2 + c) + a}{x^2}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^2} \, dx = \int \frac{a + b \operatorname{asin}(d x^2 + c)}{x^2} \, dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^2,x)
[Out] int((a + b*asin(c + d*x^2))/x^2, x)
```

3.397 $\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 284

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx = -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3(1-c^2)x} - \frac{a+b\arcsin(c+dx^2)}{3x^3} - \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[Out] 1/3*(-a-b*arcsin(d*x^2+c))/x^3-2/3*b*d^(3/2)*EllipticE(x*d^(1/2)/(1-c)^(1/2
),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(1-c)^(
1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/3*b*d^(3/2)*EllipticF(x*d^(1/2)/(1-
c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/
(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-2/3*b*d*(-d^2*x^4-2*c*d*x^2-c^
2+1)^(1/2)/(-c^2+1)/x
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used

$= \{4926, 12, 1137, 1154, 507, 435, 430\}$

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx = -\frac{a+b\arcsin(c+dx^2)}{3x^3} + \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{3\sqrt{1-c}\sqrt{-c^2-2cdx^2-d^2x^4+1}} - \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{3\sqrt{1-c}\sqrt{-c^2-2cdx^2-d^2x^4+1}} - \frac{2bd\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3(1-c^2)\,x}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^4,x]
```

```
[Out] (-2*b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(3*(1 - c^2)*x) - (a + b*ArcSi
n[c + d*x^2])/(3*x^3) - (2*b*d^(3/2)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*
x^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))
])/(3*Sqrt[1 - c]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) + (2*b*d^(3/2)*Sqrt[
1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*EllipticF[ArcSin[(Sqrt[d]*x)
/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(3*Sqrt[1 - c]*Sqrt[1 - c^2 - 2*c*d*x^2
 - d^2*x^4])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 507

```
Int[(x_)^(n_)/(Sqrt[(a_) + (b_.)*(x_)^(n_)]*Sqrt[(c_) + (d_.)*(x_)^(n_)]),
x_Symbol] :> Dist[1/b, Int[Sqrt[a + b*x^n]/Sqrt[c + d*x^n], x], x] - Dist[a
/b, Int[1/(Sqrt[a + b*x^n]*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d},
x] && NeQ[b*c - a*d, 0] && (EqQ[n, 2] || EqQ[n, 4]) &&  !(EqQ[n, 2] && Simp
```

```
lerSqrtQ[-b/a, -d/c])
```

Rule 1137

```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)/(a*d*(m + 1))), x] - Dis
t[1/(a*d^2*(m + 1)), Int[(d*x)^(m + 2)*(b*(m + 2*p + 3) + c*(m + 4*p + 5)*x
^2)*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x] && NeQ[b^2 -
 4*a*c, 0] && LtQ[m, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

Rule 1154

```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbol] :> With[{q =
 Rt[b^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt[1 + 2*c*(x^2/(
b + q))]/Sqrt[a + b*x^2 + c*x^4]), Int[x^2/(Sqrt[1 + 2*c*(x^2/(b - q))]*Sqr
t[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*
c, 0] && NegQ[c/a]
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}+\frac{1}{3}b\int\frac{2d}{x^2\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}+\frac{1}{3}(2bd)\int\frac{1}{x^2\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx\\
&= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(1-c^2\right)x}-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}-\frac{(2bd)\int\frac{d^2x^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{3\left(1-c^2\right)}\\
&= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(1-c^2\right)x}-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}-\frac{\left(2bd^3\right)\int\frac{x^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{3\left(1-c^2\right)}\\
&= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(1-c^2\right)x}-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}\\
&\quad-\frac{\left(2bd^3\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{x^2}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{3\left(1-c^2\right)\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}
$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(1-c^2\right)x} - \frac{a+b\arcsin\left(c+dx^2\right)}{3x^3} + \frac{\left(2b(1+c)d^2\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{3\left(1-c^2\right)\sqrt{1-c^2-2cdx^2-d^2x^4}} - \frac{\left(2b(1+c)d^2\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}}{\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{3\left(1-c^2\right)\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(1-c^2\right)x} - \frac{a+b\arcsin\left(c+dx^2\right)}{3x^3} - \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.86

$$\int\frac{a+b\arcsin\left(c+dx^2\right)}{x^4}\,dx = -\frac{a}{3x^3} + \frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3\left(-1+c^2\right)x} - \frac{b\arcsin\left(c+dx^2\right)}{3x^3} + \frac{2ib(1-c)d^2\sqrt{1-\frac{dx^2}{-1-c}}\sqrt{1-\frac{dx^2}{1-c}}\left(E\left(i\text{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right)|\frac{-1-c}{1-c}\right) - \text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right),\right.\right.}{3(-1+c)(1+c)\sqrt{-\frac{d}{-1-c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^4,x]
```

```
[Out] -1/3*a/x^3 + (2*b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(3*(-1 + c^2)*x) -
 (b*ArcSin[c + d*x^2])/(3*x^3) + (((2*I)/3)*b*(1 - c)*d^2*Sqrt[1 - (d*x^2)/
(-1 - c)]*Sqrt[1 - (d*x^2)/(1 - c)]*(EllipticE[I*ArcSinh[Sqrt[-(d/(-1 - c))
]*x], (-1 - c)/(1 - c)] - EllipticF[I*ArcSinh[Sqrt[-(d/(-1 - c))]*x], (-1 -
 c)/(1 - c)]))/((-1 + c)*(1 + c)*Sqrt[-(d/(-1 - c))]*Sqrt[1 - c^2 - 2*c*d*x
^2 - d^2*x^4])
```

Maple [A] (verified)

Time = 0.55 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.73

method	result
default	$-\frac{a}{3x^3}+b\left(-\frac{\arcsin(d\,x^2+c)}{3x^3}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{(c^2-1)x}-\frac{2d^2(-c^2+1)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\left(\mathrm{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)\right.}{(c^2-1)\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}\,(}\right.}{3}\right.$
parts	$-\frac{a}{3x^3}+b\left(-\frac{\arcsin(d\,x^2+c)}{3x^3}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{(c^2-1)x}-\frac{2d^2(-c^2+1)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\left(\mathrm{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)\right.}{(c^2-1)\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}\,(}\right.}{3}\right.$

```
[In] int((a+b*arcsin(d*x^2+c))/x^4,x,method=_RETURNVERBOSE)
[Out] -1/3*a/x^3+b*(-1/3/x^3*arcsin(d*x^2+c)+2/3*d*(1/(c^2-1)*(-d^2*x^4-2*c*d*x^2
-c^2+1)^(1/2)/x-2*d^2/(c^2-1)*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(
1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2*d)*(E
llipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-1+c))^
(1/2),(-1+2*c/(1+c))^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^4}\,dx=\int \frac{b\arcsin\left(dx^2+c\right)+a}{x^4}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x^2 + c) + a)/x^4, x)
```

Sympy [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^4}\,dx=\int \frac{a+b\operatorname{asin}\left(c+dx^2\right)}{x^4}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**4,x)
[Out] Integral((a + b*asin(c + d*x**2))/x**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x^4} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \int \frac{a + b \operatorname{asin}(d x^2 + c)}{x^4} \, dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^4,x)
```

```
[Out] int((a + b*asin(c + d*x^2))/x^4, x)
```

3.398 $\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 355

$$\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx = -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3} - \frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x} - \frac{a+b\arcsin(c+dx^2)}{5x^5} - \frac{8bcd^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)\middle|-\frac{1-c}{1+c}\right)}{15\sqrt{1-c}(1-c^2)\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2b(1+3c)d^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{15\sqrt{1-c}(1-c^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

```
[Out] 1/5*(-a-b*arcsin(d*x^2+c))/x^5-8/15*b*c*d^(5/2)*EllipticE(x*d^(1/2)/(1-c)^(
1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-c^
2+1)/(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/15*b*(1+3*c)*d^(5/2)*El
lipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(
1+d*x^2/(1+c))^(1/2)/(-c^2+1)/(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-
2/15*b*d*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^3-8/15*b*c*d^2*(-d^2*x
^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)^2/x
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 355, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4926, 12, 1137, 1295, 1216, 538, 435, 430}

$$\begin{aligned}&\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}dx\\&=-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}\\&+\frac{2b(3c+1)d^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{15\sqrt{1-c}\left(1-c^2\right)\sqrt{-c^2-2cdx^2-d^2x^4+1}}\\&-\frac{8bcd^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{15\sqrt{1-c}\left(1-c^2\right)\sqrt{-c^2-2cdx^2-d^2x^4+1}}\\&-\frac{8bcd^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{15\left(1-c^2\right)^2x}-\frac{2bd\sqrt{-c^2-2cdx^2-d^2x^4+1}}{15\left(1-c^2\right)x^3}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c + d*x^2])/x^6,x]
```

```
[Out] (-2*b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(15*(1 - c^2)*x^3) - (8*b*c*d^
2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(15*(1 - c^2)^2*x) - (a + b*ArcSin[c
 + d*x^2])/(5*x^5) - (8*b*c*d^(5/2)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x
^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))]
)/(15*Sqrt[1 - c]*(1 - c^2)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) + (2*b*(1
+ 3*c)*d^(5/2)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*Elliptic
F[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(15*Sqrt[1 - c]*(1
- c^2)*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 430

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

Rule 435

```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
```

```
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

Rule 538

```
Int[((e_) + (f_.)*(x_)^(n_))/(Sqrt[(a_) + (b_.)*(x_)^(n_)]*Sqrt[(c_) + (d_.
)*(x_)^(n_)]), x_Symbol] :> Dist[f/b, Int[Sqrt[a + b*x^n]/Sqrt[c + d*x^n],
x], x] + Dist[(b*e - a*f)/b, Int[1/(Sqrt[a + b*x^n]*Sqrt[c + d*x^n]), x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] &&  !(EqQ[n, 2] && ((PosQ[b/a] && PosQ
[d/c]) || (NegQ[b/a] && (PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || Simpler
SqrtQ[-b/a, -d/c]))))))
```

Rule 1137

```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)/(a*d*(m + 1))), x] - Dis
t[1/(a*d^2*(m + 1)), Int[(d*x)^(m + 2)*(b*(m + 2*p + 3) + c*(m + 4*p + 5)*x
^2)*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x] && NeQ[b^2 -
 4*a*c, 0] && LtQ[m, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

Rule 1216

```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4]), Int[(d + e*x^2)/(Sqrt[1 +
 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c
, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

Rule 1295

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)*((a_) + (b_.)*(x_)^2 + (c_.)*(
x_)^4)^(p_), x_Symbol] :> Simp[d*(f*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)
/(a*f*(m + 1))), x] + Dist[1/(a*f^2*(m + 1)), Int[(f*x)^(m + 2)*(a + b*x^2
+ c*x^4)^p*Simp[a*e*(m + 1) - b*d*(m + 2*p + 3) - c*d*(m + 4*p + 5)*x^2, x]
, x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && NeQ[b^2 - 4*a*c, 0] && LtQ[m
, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

Rule 4926

```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Dist[b/(d*(m + 1)
), Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x],
 x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u, x
] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
x]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(c+dx^2)}{5x^5}+\frac{1}{5}b\int\frac{2d}{x^4\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx$$

$$= -\frac{a+b\arcsin(c+dx^2)}{5x^5}+\frac{1}{5}(2bd)\int\frac{1}{x^4\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3}-\frac{a+b\arcsin(c+dx^2)}{5x^5}+\frac{(2bd)\int\frac{4cd+d^2x^2}{x^2\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{15(1-c^2)}$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3}-\frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x} - \frac{a+b\arcsin(c+dx^2)}{5x^5}-\frac{(2bd)\int\frac{-((1-c^2)d^2)+4cd^3x^2}{\sqrt{1-c^2-2cdx^2-d^2x^4}}\,dx}{15(1-c^2)^2}$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3} - \frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x}-\frac{a+b\arcsin(c+dx^2)}{5x^5} - \frac{\left(2bd\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{-((1-c^2)d^2)+4cd^3x^2}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{15(1-c^2)^2\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3} - \frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x}-\frac{a+b\arcsin(c+dx^2)}{5x^5} - \frac{\left(8bc(1+c)d^3\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}}{\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{15(1-c^2)^2\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{\left(2b(1+c)(1+3c)d^3\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}\right)\int\frac{1}{\sqrt{1-\frac{2d^2x^2}{-2d-2cd}}\sqrt{1-\frac{2d^2x^2}{2d-2cd}}}\,dx}{15(1-c^2)^2\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

$$= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3}-\frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x} - \frac{a+b\arcsin(c+dx^2)}{5x^5}-\frac{8bcd^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{15(1-c)^{3/2}(1+c)\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2b(1+3c)d^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{15(1-c)^{3/2}(1+c)\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.52 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.04

$$\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx$$
$$= \frac{\sqrt{\frac{d}{1+c}}\left(-3a(-1+c^2)^2\sqrt{1-c^2-2cdx^2-d^2x^4}+2bdx^2(-1-c^4+2c^3dx^2+d^2x^4+c^2(2+7d^2x^4)+c(-2\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c + d*x^2])/x^6,x]
```

```
[Out] (Sqrt[d/(1 + c)]*(-3*a*(-1 + c^2)^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] + 2
*b*d*x^2*(-1 - c^4 + 2*c^3*d*x^2 + d^2*x^4 + c^2*(2 + 7*d^2*x^4) + c*(-2*d*
x^2 + 4*d^3*x^6)) - 3*b*(-1 + c^2)^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]*Ar
cSin[c + d*x^2]) + (8*I)*b*(-1 + c)*c*d^3*x^5*Sqrt[(-1 + c + d*x^2)/(-1 + c
)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1
 + c)/(-1 + c)] - (2*I)*b*(1 - 4*c + 3*c^2)*d^3*x^5*Sqrt[(-1 + c + d*x^2)/(
-1 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*
x], (1 + c)/(-1 + c)])/(15*(-1 + c^2)^2*Sqrt[d/(1 + c)]*x^5*Sqrt[1 - c^2 -
2*c*d*x^2 - d^2*x^4])
```

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 346, normalized size of antiderivative = 0.97

method	result
default	$-\frac{a}{5x^5}+b\left(-\frac{\arcsin(d\,x^2+c)}{5x^5}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)x^3}-\frac{4cd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)^2x}-\frac{d^2\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\,\mathrm{EllipticF}\left(x\sqrt{-\right.}{3(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cd}}\right.}{}\right.$
parts	$-\frac{a}{5x^5}+b\left(-\frac{\arcsin(d\,x^2+c)}{5x^5}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)x^3}-\frac{4cd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)^2x}-\frac{d^2\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\,\mathrm{EllipticF}\left(x\sqrt{-\right.}{3(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cd}}\right.}{}\right.$

```
[In] int((a+b*arcsin(d*x^2+c))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a/x^5+b*(-1/5/x^5*arcsin(d*x^2+c)+2/5*d*(1/3/(c^2-1)*(-d^2*x^4-2*c*d*x
^2-c^2+1)^(1/2)/x^3-4/3*c*d/(c^2-1)^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/x-1/
3*d^2/(c^2-1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2
```

```
)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1
+c))^(1/2))+8/3*c*d^3/(c^2-1)^2*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)
^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2*d)*
(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-1+c)
)^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

Fricas [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^6} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x^6} \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="fricas")
[Out] integral((b*arcsin(d*x^2 + c) + a)/x^6, x)
```

Sympy [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^6} \, dx = \int \frac{a + b \operatorname{asin}(c + dx^2)}{x^6} \, dx$$

```
[In] integrate((a+b*asin(d*x**2+c))/x**6,x)
[Out] Integral((a + b*asin(c + d*x**2))/x**6, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^6} \, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c-1>0)', see `assume?` for more det
ails)Is
```

Giac [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx = \int \frac{b\arcsin(dx^2+c)+a}{x^6}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + c) + a)/x^6, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx = \int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^6}\,dx$$

```
[In] int((a + b*asin(c + d*x^2))/x^6,x)
[Out] int((a + b*asin(c + d*x^2))/x^6, x)
```

3.399 $\int x^3 \arcsin(a+bx^4)\,dx$

Optimal result

Integrand size = 12, antiderivative size = 47

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{\sqrt{1-(a+bx^4)^2}}{4b} + \frac{(a+bx^4)\arcsin(a+bx^4)}{4b}$$

```
[Out] 1/4*(b*x^4+a)*arcsin(b*x^4+a)/b+1/4*(1-(b*x^4+a)^2)^(1/2)/b
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6847, 4887, 4715, 267}

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{(a+bx^4)\arcsin(a+bx^4)}{4b} + \frac{\sqrt{1-(a+bx^4)^2}}{4b}$$

```
[In] Int[x^3*ArcSin[a + b*x^4],x]
```

```
[Out] Sqrt[1 - (a + b*x^4)^2]/(4*b) + ((a + b*x^4)*ArcSin[a + b*x^4])/(4*b)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{4}\text{Subst}\left(\int \arcsin(a+bx)\,dx, x, x^4\right)\\ &= \frac{\text{Subst}\left(\int \arcsin(x)\,dx, x, a+bx^4\right)}{4b}\\ &= \frac{(a+bx^4)\arcsin\left(a+bx^4\right)}{4b} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, a+bx^4\right)}{4b}\\ &= \frac{\sqrt{1-(a+bx^4)^2}}{4b} + \frac{(a+bx^4)\arcsin\left(a+bx^4\right)}{4b}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.87

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx = \frac{\sqrt{1-(a+bx^4)^2} + (a+bx^4)\arcsin\left(a+bx^4\right)}{4b}$$

```
[In] Integrate[x^3*ArcSin[a + b*x^4],x]
[Out] (Sqrt[1 - (a + b*x^4)^2] + (a + b*x^4)*ArcSin[a + b*x^4])/(4*b)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.81

method	result	size
derivativedivides	$\frac{(b\,x^{4}+a)\,\mathrm{arcsin}(b\,x^{4}+a)+\sqrt{1-(b\,x^{4}+a)^{2}}}{4b}$	38
default	$\frac{(b\,x^{4}+a)\,\mathrm{arcsin}(b\,x^{4}+a)+\sqrt{1-(b\,x^{4}+a)^{2}}}{4b}$	38

```
[In] int(x^3*arcsin(b*x^4+a),x,method=_RETURNVERBOSE)
[Out] 1/4/b*((b*x^4+a)*arcsin(b*x^4+a)+(1-(b*x^4+a)^2)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.98

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx = \frac{(bx^4+a)\arcsin\left(bx^4+a\right)+\sqrt{-b^2x^8-2\,abx^4-a^2+1}}{4\,b}$$

```
[In] integrate(x^3*arcsin(b*x^4+a),x, algorithm="fricas")
[Out] 1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-b^2*x^8 - 2*a*b*x^4 - a^2 + 1))/
b
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.30

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx = \begin{cases} \frac{a\,\mathrm{asin}\,(a+bx^4)}{4b}+\frac{x^4\,\mathrm{asin}\,(a+bx^4)}{4}+\frac{\sqrt{-a^2-2abx^4-b^2x^8+1}}{4b} & \text{for } b\neq 0 \\ \frac{x^4\,\mathrm{asin}\,(a)}{4} & \text{otherwise} \end{cases}$$

```
[In] integrate(x**3*asin(b*x**4+a),x)
[Out] Piecewise(((a*asin(a + b*x**4)/(4*b) + x**4*asin(a + b*x**4)/4 + sqrt(-a**2
- 2*a*b*x**4 - b**2*x**8 + 1)/(4*b), Ne(b, 0)), (x**4*asin(a)/4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int x^3 \arcsin \left(a+bx^4\right) \, dx = \frac{(bx^4+a)\arcsin\left(bx^4+a\right)+\sqrt{-\left(bx^4+a\right)^2+1}}{4\,b}$$

```
[In] integrate(x^3*arcsin(b*x^4+a),x, algorithm="maxima")
[Out] 1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-(b*x^4 + a)^2 + 1))/b
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int x^3 \arcsin \left(a+bx^4\right) \, dx = \frac{(bx^4+a)\arcsin\left(bx^4+a\right)+\sqrt{-\left(bx^4+a\right)^2+1}}{4\,b}$$

```
[In] integrate(x^3*arcsin(b*x^4+a),x, algorithm="giac")
[Out] 1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-(b*x^4 + a)^2 + 1))/b
```

Mupad [B] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 99, normalized size of antiderivative = 2.11

$$\int x^3 \arcsin \left(a+bx^4\right) \, dx = \frac{x^4\,\mathrm{asin}(b\,x^4+a)}{4}+\frac{\sqrt{-a^2-2\,a\,b\,x^4-b^2\,x^8+1}}{4\,b} + \frac{a\,\ln\left(\sqrt{-a^2-2\,a\,b\,x^4-b^2\,x^8+1}-\frac{b^2\,x^4+a\,b}{\sqrt{-b^2}}\right)}{4\,\sqrt{-b^2}}$$

```
[In] int(x^3*asin(a + b*x^4),x)
[Out] (x^4*asin(a + b*x^4))/4 + (1 - b^2*x^8 - 2*a*b*x^4 - a^2)^(1/2)/(4*b) + (a*
log((1 - b^2*x^8 - 2*a*b*x^4 - a^2)^(1/2) - (a*b + b^2*x^4)/(-b^2)^(1/2)))/
(4*(-b^2)^(1/2))
```

3.400 $\int x^{-1+n} \arcsin(a+bx^n)\,dx$

Optimal result

Integrand size = 14, antiderivative size = 47

$$\int x^{-1+n} \arcsin(a+bx^n)\,dx = \frac{\sqrt{1-(a+bx^n)^2}}{bn} + \frac{(a+bx^n)\arcsin(a+bx^n)}{bn}$$

```
[Out] (a+b*x^n)*arcsin(a+b*x^n)/b/n+(1-(a+b*x^n)^2)^(1/2)/b/n
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {6847, 4887, 4715, 267}

$$\int x^{-1+n} \arcsin(a+bx^n)\,dx = \frac{(a+bx^n)\arcsin(a+bx^n)}{bn} + \frac{\sqrt{1-(a+bx^n)^2}}{bn}$$

```
[In] Int[x^(-1 + n)*ArcSin[a + b*x^n],x]
```

```
[Out] Sqrt[1 - (a + b*x^n)^2]/(b*n) + ((a + b*x^n)*ArcSin[a + b*x^n])/(b*n)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4887

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, n
}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \arcsin(a+bx)\,dx, x, x^n\right)}{n} \\
&= \frac{\text{Subst}\left(\int \arcsin(x)\,dx, x, a+bx^n\right)}{bn} \\
&= \frac{(a+bx^n)\arcsin\left(a+bx^n\right)}{bn} - \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1-x^2}}\,dx, x, a+bx^n\right)}{bn} \\
&= \frac{\sqrt{1-(a+bx^n)^2}}{bn} + \frac{(a+bx^n)\arcsin\left(a+bx^n\right)}{bn}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int x^{-1+n}\arcsin\left(a+bx^n\right)\,dx = \frac{\sqrt{1-(a+bx^n)^2}}{bn} + \frac{(a+bx^n)\arcsin\left(a+bx^n\right)}{bn}$$

```
[In] Integrate[x^(-1 + n)*ArcSin[a + b*x^n],x]
[Out] Sqrt[1 - (a + b*x^n)^2]/(b*n) + ((a + b*x^n)*ArcSin[a + b*x^n])/(b*n)
```

Maple [F]

$$\int x^{n-1} \arcsin \left(a+b\,x^{n}\right)dx$$

[In] int(x^(n-1)*arcsin(a+b*x^n),x)

[Out] int(x^(n-1)*arcsin(a+b*x^n),x)

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.21

$$\int x^{-1+n} \arcsin \left(a+bx^{n}\right)\,dx = \frac{bx^{n} \arcsin \left(bx^{n}+a\right)+a \arcsin \left(bx^{n}+a\right)+\sqrt{-b^{2}x^{2\,n}-2\,abx^{n}-a^{2}+1}}{bn}$$

[In] integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="fricas")

[Out] (b*x^n*arcsin(b*x^n + a) + a*arcsin(b*x^n + a) + sqrt(-b^2*x^(2*n) - 2*a*b*x^n - a^2 + 1))/(b*n)

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 80 vs. 2(34) = 68.

Time = 12.94 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.70

$$\int x^{-1+n} \arcsin \left(a+bx^{n}\right)\,dx = \begin{cases} \log \left(x\right) \operatorname{asin}\left(a\right) & \text{for}\: b=0 \wedge n=0 \\ \frac{xx^{n-1} \operatorname{asin}\left(a\right)}{n} & \text{for}\: b=0 \\ \log \left(x\right) \operatorname{asin}\left(a+b\right) & \text{for}\: n=0 \\ \frac{a \operatorname{asin}\left(a+bx^{n}\right)}{bn}+\frac{x^{n} \operatorname{asin}\left(a+bx^{n}\right)}{n}+\frac{\sqrt{-a^{2}-2abx^{n}-b^{2}x^{2n}+1}}{bn} & \text{otherwise} \end{cases}$$

[In] integrate(x**(-1+n)*asin(a+b*x**n),x)

[Out] Piecewise((log(x)*asin(a), Eq(b, 0) & Eq(n, 0)), (x*x**(n - 1)*asin(a)/n, Eq(b, 0)), (log(x)*asin(a + b), Eq(n, 0)), (a*asin(a + b*x**n)/(b*n) + x**n*asin(a + b*x**n)/n + sqrt(-a**2 - 2*a*b*x**n - b**2*x**(2*n) + 1)/(b*n), True))

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.83

$$\int x^{-1+n} \arcsin\left(a+bx^n\right)\,dx = \frac{(bx^n+a)\arcsin\left(bx^n+a\right)+\sqrt{-(bx^n+a)^2+1}}{bn}$$

```
[In] integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="maxima")
[Out] ((b*x^n + a)*arcsin(b*x^n + a) + sqrt(-(b*x^n + a)^2 + 1))/(b*n)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.83

$$\int x^{-1+n} \arcsin\left(a+bx^n\right)\,dx = \frac{(bx^n+a)\arcsin\left(bx^n+a\right)+\sqrt{-(bx^n+a)^2+1}}{bn}$$

```
[In] integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="giac")
[Out] ((b*x^n + a)*arcsin(b*x^n + a) + sqrt(-(b*x^n + a)^2 + 1))/(b*n)
```

Mupad [B] (verification not implemented)

Time = 0.38 (sec) , antiderivative size = 109, normalized size of antiderivative = 2.32

$$\int x^{-1+n} \arcsin\left(a+bx^n\right)\,dx = \frac{x^n\,\mathrm{asin}(a+b\,x^n)}{n}+\frac{\sqrt{1-b^2\,x^{2\,n}-2\,a\,b\,x^n-a^2}}{b\,n}+\frac{a\,\ln\left(\sqrt{1-b^2\,x^{2\,n}-2\,a\,b\,x^n-a^2}-\frac{a\,b+b^2\,x^n}{\sqrt{-b^2}}\right)}{n\,\sqrt{-b^2}}$$

```
[In] int(x^(n - 1)*asin(a + b*x^n),x)
[Out] (x^n*asin(a + b*x^n))/n + (1 - b^2*x^(2*n) - 2*a*b*x^n - a^2)^(1/2)/(b*n) +
 (a*log((1 - b^2*x^(2*n) - 2*a*b*x^n - a^2)^(1/2) - (a*b + b^2*x^n)/(-b^2)^
(1/2)))/(n*(-b^2)^(1/2))
```

3.401 $\int (a+b\arcsin(1+dx^2))^4\,dx$

Optimal result

Integrand size = 14, antiderivative size = 127

$$\int (a+b\arcsin(1+dx^2))^4\,dx = 384b^4x-\frac{192b^3\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} - 48b^2x\left(a+b\arcsin(1+dx^2)\right)^2 + \frac{8b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^3}{dx} + x\left(a+b\arcsin(1+dx^2)\right)^4$$

```
[Out] 384*b^4*x-48*b^2*x*(a+b*arcsin(d*x^2+1))^2+x*(a+b*arcsin(d*x^2+1))^4-192*b^
3*(a+b*arcsin(d*x^2+1))*(-d^2*x^4-2*d*x^2)^(1/2)/d/x+8*b*(a+b*arcsin(d*x^2+
1))^3*(-d^2*x^4-2*d*x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4898, 8}

$$\int (a+b\arcsin(1+dx^2))^4\,dx = -\frac{192b^3\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))}{dx} - 48b^2x\left(a+b\arcsin(dx^2+1)\right)^2 + \frac{8b\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))^3}{dx} + x\left(a+b\arcsin(dx^2+1)\right)^4+384b^4x$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^4,x]
```

```
[Out] 384*b^4*x - (192*b^3*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2]))/(d
*x) - 48*b^2*x*(a + b*ArcSin[1 + d*x^2])^2 + (8*b*Sqrt[-2*d*x^2 - d^2*x^4]*
(a + b*ArcSin[1 + d*x^2])^3)/(d*x) + x*(a + b*ArcSin[1 + d*x^2])^4
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{8b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^3}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^4 - \left(48b^2\right)\int\left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx \\
&= -\frac{192b^3\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} - 48b^2x\left(a+b\arcsin\left(1+dx^2\right)\right)^2 \\
&\quad + \frac{8b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^3}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^4 \\
&\quad + \left(384b^4\right)\int 1\,dx \\
&= 384b^4x - \frac{192b^3\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} - 48b^2x\Big(a \\
&\qquad + b\arcsin\left(1+dx^2\right)\Big)^2 \\
&\quad + \frac{8b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^3}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^4
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.97

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx=\frac{8b\sqrt{-dx^2\left(2+dx^2\right)}\left(a+b\arcsin\left(1+dx^2\right)\right)^3}{dx}+x\left(a+b\arcsin\left(1+dx^2\right)\right)^4-48b^2\left(-8b^2x+\frac{4b\sqrt{-dx^2\left(2+dx^2\right)}\left(a+b\arcsin\left(1+dx^2\right)\right)}{dx}+x\left(a+b\arcsin\left(1+dx^2\right)\right)^2\right)$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^4,x]
[Out] (8*b*Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^3)/(d*x) + x*(a +
 b*ArcSin[1 + d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[-(d*x^2*(2 + d*x^2))
]*(a + b*ArcSin[1 + d*x^2]))/(d*x) + x*(a + b*ArcSin[1 + d*x^2])^2)
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2+1\right)\right)^4dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^4,x)
[Out] int((a+b*arcsin(d*x^2+1))^4,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.63

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx$$
$$=\frac{b^4dx^2\arcsin\left(dx^2+1\right)^4+4\,ab^3dx^2\arcsin\left(dx^2+1\right)^3+6\left(a^2b^2-8\,b^4\right)dx^2\arcsin\left(dx^2+1\right)^2+4\left(a^3b-24\,ab^3\right.}{}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="fricas")
[Out] (b^4*d*x^2*arcsin(d*x^2 + 1)^4 + 4*a*b^3*d*x^2*arcsin(d*x^2 + 1)^3 + 6*(a^2
*b^2 - 8*b^4)*d*x^2*arcsin(d*x^2 + 1)^2 + 4*(a^3*b - 24*a*b^3)*d*x^2*arcsin
(d*x^2 + 1) + (a^4 - 48*a^2*b^2 + 384*b^4)*d*x^2 + 8*(b^4*arcsin(d*x^2 + 1)
^3 + 3*a*b^3*arcsin(d*x^2 + 1)^2 + a^3*b - 24*a*b^3 + 3*(a^2*b^2 - 8*b^4)*a
rcsin(d*x^2 + 1))*sqrt(-d^2*x^4 - 2*d*x^2))/(d*x)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)^4\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**4,x)
```

```
[Out] Integral((a + b*asin(d*x**2 + 1))**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 664 vs. $2(123) = 246$.

Time = 1.03 (sec) , antiderivative size = 664, normalized size of antiderivative = 5.23

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx$$

$$= 4\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\operatorname{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2d}}{d\operatorname{sgn}(x)}\right)a^3b$$

$$+6\left(x\arcsin\left(dx^2+1\right)^2-\frac{2\left(\sqrt{2}\pi\sqrt{-d}|d|+4\sqrt{2}\sqrt{-d}d\right)\operatorname{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2-2d}\arcsin\left(dx^2+1\right)+\frac{2(\cdots}{\cdots}\right.}{d\operatorname{sgn}(x)}\right.$$

$$+2\left(2x\arcsin\left(dx^2+1\right)^3-\frac{3\left(\sqrt{2}\pi^2\sqrt{-d}d-8\sqrt{2}\pi\sqrt{-d}|d|-32\sqrt{2}\sqrt{-d}d\right)\operatorname{sgn}(x)}{d^2}+\frac{12\left(\sqrt{-d^2x^2-2d}\cdots\right.}{\cdots}\right.$$

$$+\left(x\arcsin\left(dx^2+1\right)^4-\frac{\left(\sqrt{2}\pi^3\sqrt{-d}|d|+12\sqrt{2}\pi^2\sqrt{-d}d-96\sqrt{2}\pi\sqrt{-d}|d|-384\sqrt{2}\sqrt{-d}d\right)\operatorname{sgn}(x)}{d|d|}+\frac{4\cdots}{\cdots}\right.$$

$$+a^4x$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="giac")
```

```
[Out] 4*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2*
d)/(d*sgn(x)))*a^3*b + 6*(x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*ab
s(d) + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)*ar
csin(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x))
)*a^2*b^2 + 2*(2*x*arcsin(d*x^2 + 1)^3 - 3*(sqrt(2)*pi^2*sqrt(-d)*d - 8*sqr
t(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)*sgn(x)/d^2 + 12*(sqrt(-d^2
*x^2 - 2*d)*arcsin(d*x^2 + 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 + d)/d
) - 4*(sqrt(2)*sqrt(-d) - sqrt(-d^2*x^2 - 2*d))*d/abs(d) + (sqrt(2)*pi*sqrt
(-d)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d))/(d*sgn(x)))*a*b^3 + (
x*arcsin(d*x^2 + 1)^4 - (sqrt(2)*pi^3*sqrt(-d)*abs(d) + 12*sqrt(2)*pi^2*sqr
```

```
t(-d)*d - 96*sqrt(2)*pi*sqrt(-d)*abs(d) - 384*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d
*abs(d)) + 4*(2*sqrt(-d^2*x^2 - 2*d)*arcsin(d*x^2 + 1)^3 - 3*(4*sqrt(d^2*x^
2)*arcsin((d^2*x^2 + d)/d)^2 + 8*(2*sqrt(-d^2*x^2 - 2*d)*arcsin((d^2*x^2 +
d)/d) + 4*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d) - (sqrt(2)*pi*sqrt(-d
)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d) - (sqrt(2)*pi^2*sqrt(-d)*
d - 8*sqrt(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)/d)*d/abs(d))/(d*s
gn(x)))*b^4 + a^4*x
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^4\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^4,x)
[Out] int((a + b*asin(d*x^2 + 1))^4, x)
```

3.402 $\int (a+b\arcsin(1+dx^2))^3\,dx$

Optimal result

Integrand size = 14, antiderivative size = 110

$$\int (a+b\arcsin(1+dx^2))^3\,dx = -24ab^2x - \frac{48b^3\sqrt{-2dx^2-d^2x^4}}{dx} - 24b^3x\arcsin(1+dx^2) + \frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} + x(a+b\arcsin(1+dx^2))^3$$

```
[Out] -24*a*b^2*x-24*b^3*x*arcsin(d*x^2+1)+x*(a+b*arcsin(d*x^2+1))^3-48*b^3*(-d^2
*x^4-2*d*x^2)^(1/2)/d/x+6*b*(a+b*arcsin(d*x^2+1))^2*(-d^2*x^4-2*d*x^2)^(1/2
)/d/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4898, 4924, 12, 1602}

$$\int (a+b\arcsin(1+dx^2))^3\,dx = \frac{6b\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))^2}{dx} + x(a+b\arcsin(dx^2+1))^3 - 24ab^2x - 24b^3x\arcsin(dx^2+1) - \frac{48b^3\sqrt{-d^2x^4-2dx^2}}{dx}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^3,x]
```

```
[Out] -24*a*b^2*x - (48*b^3*Sqrt[-2*d*x^2 - d^2*x^4])/(d*x) - 24*b^3*x*ArcSin[1 +
 d*x^2] + (6*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2])^2)/(d*x)
+ x*(a + b*ArcSin[1 + d*x^2])^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1602

```
Int[(Pp_)*(Qq_)^(m_.), x_Symbol] :> With[{p = Expon[Pp, x], q = Expon[Qq, x
]}, Simp[Coeff[Pp, x, p]*x^(p - q + 1)*(Qq^(m + 1)/((p + m*q + 1)*Coeff[Qq,
 x, q])), x] /; NeQ[p + m*q + 1, 0] && EqQ[(p + m*q + 1)*Coeff[Qq, x, q]*Pp
, Coeff[Pp, x, p]*x^(p - q)*((p - q + 1)*Qq + (m + 1)*x*D[Qq, x])]] /; Free
Q[m, x] && PolyQ[Pp, x] && PolyQ[Qq, x] && NeQ[m, -1]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^3-\left(24b^2\right)\int\left(a+b\arcsin\left(1+dx^2\right)\right)\,dx \\
&= -24ab^2x+\frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^3-\left(24b^3\right)\int\arcsin\left(1+dx^2\right)\,dx \\
&= -24ab^2x-24b^3x\arcsin\left(1+dx^2\right)+\frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^3+\left(24b^3\right)\int\frac{2dx^2}{\sqrt{-2dx^2-d^2x^4}}\,dx \\
&= -24ab^2x-24b^3x\arcsin\left(1+dx^2\right)+\frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^3+\left(48b^3d\right)\int\frac{x^2}{\sqrt{-2dx^2-d^2x^4}}\,dx
\end{aligned}$$

$$= -24ab^2x - \frac{48b^3\sqrt{-2dx^2 - d^2x^4}}{dx} - 24b^3x\arcsin\left(1 + dx^2\right) + \frac{6b\sqrt{-2dx^2 - d^2x^4}(a + b\arcsin\left(1 + dx^2\right))^2}{dx} + x\left(a + b\arcsin\left(1 + dx^2\right)\right)^3$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.47

$$\int \left(a + b\arcsin\left(1 + dx^2\right)\right)^3\, dx = \frac{a(a^2 - 24b^2)\, dx^2 + 6b(a^2 - 8b^2)\, \sqrt{-dx^2\,(2 + dx^2)} + 3b\left(a^2dx^2 - 8b^2dx^2 + 4ab\sqrt{-dx^2\,(2 + dx^2)}\right)\arcsin(1}{dx}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^3,x]
```

```
[Out] (a*(a^2 - 24*b^2)*d*x^2 + 6*b*(a^2 - 8*b^2)*Sqrt[-(d*x^2*(2 + d*x^2))] + 3*
b*(a^2*d*x^2 - 8*b^2*d*x^2 + 4*a*b*Sqrt[-(d*x^2*(2 + d*x^2))])*ArcSin[1 + d
*x^2] + 3*b^2*(a*d*x^2 + 2*b*Sqrt[-(d*x^2*(2 + d*x^2))])*ArcSin[1 + d*x^2]^
2 + b^3*d*x^2*ArcSin[1 + d*x^2]^3)/(d*x)
```

Maple [F]

$$\int \left(a + b\arcsin\left(d\,x^2 + 1\right)\right)^3 dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^3,x)
```

```
[Out] int((a+b*arcsin(d*x^2+1))^3,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.31

$$\int \left(a + b\arcsin\left(1 + dx^2\right)\right)^3\, dx = \frac{b^3dx^2\arcsin\left(dx^2 + 1\right)^3 + 3\,ab^2dx^2\arcsin\left(dx^2 + 1\right)^2 + 3\left(a^2b - 8\,b^3\right)dx^2\arcsin\left(dx^2 + 1\right) + \left(a^3 - 24\,ab^2\right)dx^2}{dx}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="fricas")
```

```
[Out] (b^3*d*x^2*arcsin(d*x^2 + 1)^3 + 3*a*b^2*d*x^2*arcsin(d*x^2 + 1)^2 + 3*(a^2
*b - 8*b^3)*d*x^2*arcsin(d*x^2 + 1) + (a^3 - 24*a*b^2)*d*x^2 + 6*sqrt(-d^2*
x^4 - 2*d*x^2)*(b^3*arcsin(d*x^2 + 1)^2 + 2*a*b^2*arcsin(d*x^2 + 1) + a^2*b
 - 8*b^3))/(d*x)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\int \left(a+b\,\text{asin}\left(dx^2+1\right)\right)^3\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**3,x)
```

```
[Out] Integral((a + b*asin(d*x**2 + 1))**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. $2(106) = 212$.

Time = 0.68 (sec) , antiderivative size = 370, normalized size of antiderivative = 3.36

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx$$
$$=3\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\text{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2\,d}}{d\text{sgn}\left(x\right)}\right)a^2b$$
$$+3\left(x\arcsin\left(dx^2+1\right)^2-\frac{2\left(\sqrt{2}\pi\sqrt{-d}|d|+4\sqrt{2}\sqrt{-d}d\right)\text{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2-2\,d}\arcsin\left(dx^2+1\right)+\right.}{d\text{sgn}\left(x\right)}\right.$$
$$+\frac{1}{2}\left(2\,x\arcsin\left(dx^2+1\right)^3-\frac{3\left(\sqrt{2}\pi^2\sqrt{-d}d-8\sqrt{2}\pi\sqrt{-d}|d|-32\sqrt{2}\sqrt{-d}d\right)\text{sgn}(x)}{d^2}+\frac{12\left(\sqrt{-d^2x^2-2}\right.}{}\right.$$
$$+a^3x$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="giac")
```

```
[Out] 3*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2*
d)/(d*sgn(x)))*a^2*b + 3*(x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*ab
s(d) + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)*ar
csin(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x))
)*a*b^2 + 1/2*(2*x*arcsin(d*x^2 + 1)^3 - 3*(sqrt(2)*pi^2*sqrt(-d)*d - 8*sqr
t(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)*sgn(x)/d^2 + 12*(sqrt(-d^2
*x^2 - 2*d)*arcsin(d*x^2 + 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 + d)/d
) - 4*(sqrt(2)*sqrt(-d) - sqrt(-d^2*x^2 - 2*d))*d/abs(d) + (sqrt(2)*pi*sqrt
(-d)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d))/(d*sgn(x)))*b^3 + a^3
*x
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^3\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^3,x)
```

```
[Out] int((a + b*asin(d*x^2 + 1))^3, x)
```

3.403 $\int (a+b \arcsin (1+d x^2))^2 \, dx$

Optimal result

Integrand size = 14, antiderivative size = 63

$$\int (a+b \arcsin (1+d x^2))^2 \, dx = -8b^2x+\frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} + x(a+b\arcsin(1+dx^2))^2$$

```
[Out] -8*b^2*x+x*(a+b*arcsin(d*x^2+1))^2+4*b*(a+b*arcsin(d*x^2+1))*(-d^2*x^4-2*d*
x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4898, 8}

$$\int (a+b \arcsin (1+d x^2))^2 \, dx = \frac{4b\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))}{dx} + x(a+b\arcsin(dx^2+1))^2-8b^2x$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^2,x]
```

```
[Out] -8*b^2*x + (4*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2]))/(d*x) +
 x*(a + b*ArcSin[1 + d*x^2])^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} \\ &\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^2 - \left(8b^2\right)\int 1\,dx \\ &= -8b^2x + \frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^2\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx = -8b^2x + \frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^2$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^2,x]
[Out] -8*b^2*x + (4*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2]))/(d*x) +
 x*(a + b*ArcSin[1 + d*x^2])^2
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2+1\right)\right)^2dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^2,x)
[Out] int((a+b*arcsin(d*x^2+1))^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.44

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx$$
$$=\frac{b^2dx^2\arcsin\left(dx^2+1\right)^2+2\,abdx^2\arcsin\left(dx^2+1\right)+(a^2-8\,b^2)dx^2+4\,\sqrt{-d^2x^4-2\,dx^2}(b^2\arcsin\left(dx^2+1\right.}{dx}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="fricas")
```

```
[Out] (b^2*d*x^2*arcsin(d*x^2 + 1)^2 + 2*a*b*d*x^2*arcsin(d*x^2 + 1) + (a^2 - 8*b
^2)*d*x^2 + 4*sqrt(-d^2*x^4 - 2*d*x^2)*(b^2*arcsin(d*x^2 + 1) + a*b))/(d*x)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx=\int \left(a+b\operatorname{asin}\left(dx^2+1\right)\right)^2\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**2,x)
```

```
[Out] Integral((a + b*asin(d*x**2 + 1))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. 2(61) = 122.

Time = 0.42 (sec) , antiderivative size = 172, normalized size of antiderivative = 2.73

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx$$
$$= 2\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\mathrm{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2d}}{d\mathrm{sgn}\left(x\right)}\right)ab$$
$$+\left(x\arcsin\left(dx^2+1\right)^2-\frac{2\left(\sqrt{2}\pi\sqrt{-d}|d|+4\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2-2d}\arcsin\left(dx^2+1\right)+\frac{2(\sqrt{\cdots}}{\cdots}\right.}{d\mathrm{sgn}\left(x\right)}\right.$$
$$+a^2x$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="giac")
```

```
[Out] 2*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2*
d)/(d*sgn(x)))*a*b + (x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*abs(d)
 + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)*arcsin
(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*b^
2 + a^2*x
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^2\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^2,x)
```

```
[Out] int((a + b*asin(d*x^2 + 1))^2, x)
```

3.404 $\int (a+b\arcsin(1+dx^2))\,dx$

Optimal result

Integrand size = 12, antiderivative size = 43

$$\int (a+b\arcsin(1+dx^2))\,dx = ax + \frac{2b\sqrt{-2dx^2-d^2x^4}}{dx} + bx\arcsin(1+dx^2)$$

```
[Out] a*x+b*x*arcsin(d*x^2+1)+2*b*(-d^2*x^4-2*d*x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4924, 12, 1602}

$$\int (a+b\arcsin(1+dx^2))\,dx = ax + bx\arcsin(dx^2+1) + \frac{2b\sqrt{-d^2x^4-2dx^2}}{dx}$$

```
[In] Int[a + b*ArcSin[1 + d*x^2],x]
[Out] a*x + (2*b*Sqrt[-2*d*x^2 - d^2*x^4])/(d*x) + b*x*ArcSin[1 + d*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1602

```
Int[(Pp_)*(Qq_)^(m_.), x_Symbol] :> With[{p = Expon[Pp, x], q = Expon[Qq, x
]}, Simp[Coeff[Pp, x, p]*x^(p - q + 1)*(Qq^(m + 1)/((p + m*q + 1)*Coeff[Qq,
 x, q])), x] /; NeQ[p + m*q + 1, 0] && EqQ[(p + m*q + 1)*Coeff[Qq, x, q]*Pp
, Coeff[Pp, x, p]*x^(p - q)*((p - q + 1)*Qq + (m + 1)*x*D[Qq, x])]] /; Free
```

```
Q[m, x] && PolyQ[Pp, x] && PolyQ[Qq, x] && NeQ[m, -1]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= ax + b\int \arcsin\left(1+dx^2\right)\,dx \\
&= ax + bx\arcsin\left(1+dx^2\right) - b\int \frac{2dx^2}{\sqrt{-2dx^2-d^2x^4}}\,dx \\
&= ax + bx\arcsin\left(1+dx^2\right) - (2bd)\int \frac{x^2}{\sqrt{-2dx^2-d^2x^4}}\,dx \\
&= ax + \frac{2b\sqrt{-2dx^2-d^2x^4}}{dx} + bx\arcsin\left(1+dx^2\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.95

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx = ax + \frac{2b\sqrt{-dx^2\left(2+dx^2\right)}}{dx} + bx\arcsin\left(1+dx^2\right)$$

```
[In] Integrate[a + b*ArcSin[1 + d*x^2],x]
[Out] a*x + (2*b*Sqrt[-(d*x^2*(2 + d*x^2))])/(d*x) + b*x*ArcSin[1 + d*x^2]
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.05

method	result	size
default	$ax+b\left(x\arcsin\left(d\,x^{2}+1\right)-\frac{2x\left(d\,x^{2}+2\right)}{\sqrt{-d^{2}x^{4}-2d\,x^{2}}}\right)$	45
parts	$ax+b\left(x\arcsin\left(d\,x^{2}+1\right)-\frac{2x\left(d\,x^{2}+2\right)}{\sqrt{-d^{2}x^{4}-2d\,x^{2}}}\right)$	45

```
[In] int(a+b*arcsin(d*x^2+1),x,method=_RETURNVERBOSE)
[Out] a*x+b*(x*arcsin(d*x^2+1)-2/(-d^2*x^4-2*d*x^2)^(1/2)*x*(d*x^2+2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.12

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\frac{bdx^2\arcsin\left(dx^2+1\right)+adx^2+2\sqrt{-d^2x^4-2\,dx^2}b}{dx}$$

```
[In] integrate(a+b*arcsin(d*x^2+1),x, algorithm="fricas")
[Out] (b*d*x^2*arcsin(d*x^2 + 1) + a*d*x^2 + 2*sqrt(-d^2*x^4 - 2*d*x^2)*b)/(d*x)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)\,dx$$

```
[In] integrate(a+b*asin(d*x**2+1),x)
[Out] Integral(a + b*asin(d*x**2 + 1), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.05

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\left(x\arcsin\left(dx^2+1\right)-\frac{2\left(d^{\frac{3}{2}}x^2+2\sqrt{d}\right)}{\sqrt{-dx^2-2}d}\right)b+ax$$

```
[In] integrate(a+b*arcsin(d*x^2+1),x, algorithm="maxima")
[Out] (x*arcsin(d*x^2 + 1) - 2*(d^(3/2)*x^2 + 2*sqrt(d))/(sqrt(-d*x^2 - 2)*d))*b
+ a*x
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.28

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\mathrm{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2\,d}}{d\mathrm{sgn}\left(x\right)}\right)b+ax$$

```
[In] integrate(a+b*arcsin(d*x^2+1),x, algorithm="giac")
[Out] (x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2*d)
/(d*sgn(x)))*b + a*x
```

Mupad [B] (verification not implemented)

Time = 0.56 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.91

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=a\,x+b\,x\,\mathrm{asin}\left(d\,x^2+1\right)+\frac{2\,b\,\sqrt{1-{\left(d\,x^2+1\right)}^2}}{d\,x}$$

```
[In] int(a + b*asin(d*x^2 + 1),x)
[Out] a*x + b*x*asin(d*x^2 + 1) + (2*b*(1 - (d*x^2 + 1)^2)^(1/2))/(d*x)
```

3.405 $\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 159

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = -\frac{x\,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

```
[Out] -1/2*x*Ci(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b/(cos(1
/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/2*x*Si(1/2*(a+b*arcsin(d*x^
2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*ar
csin(d*x^2+1)))
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {4900}

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = -\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} - \frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-1),x]
```

```
[Out] -1/2*(x*CosIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)]*(Cos[a/(2*b)] - Sin[a/
(2*b)]))/(b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) - (x*(Co
s[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)])/(2
*b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Rule 4900

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = -\frac{x \,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.75

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = -\frac{x\left(\text{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin\left(1+dx^2\right)\right)\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin\left(1\right.\right.\right.}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-1),x]
```

```
[Out] -1/2*(x*(CosIntegral[(a/b + ArcSin[1 + d*x^2])/2]*(Cos[a/(2*b)] - Sin[a/(2*
b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a/b + ArcSin[1 + d*x^2])/
2]))/(b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Maple [F]

$$\int \frac{1}{a + b \arcsin(d\,x^2 + 1)}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2+1)),x)
[Out] int(1/(a+b*arcsin(d*x^2+1)),x)
```

Fricas [F]

$$\int \frac{1}{a + b \arcsin(1 + dx^2)}\,dx = \int \frac{1}{b \arcsin(dx^2 + 1) + a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="fricas")
[Out] integral(1/(b*arcsin(d*x^2 + 1) + a), x)
```

Sympy [F]

$$\int \frac{1}{a + b \arcsin(1 + dx^2)}\,dx = \int \frac{1}{a + b \operatorname{asin}(dx^2 + 1)}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2+1)),x)
[Out] Integral(1/(a + b*asin(d*x**2 + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{a + b \arcsin(1 + dx^2)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \frac{1}{a + b\arcsin(1 + dx^2)}\,dx = \int \frac{1}{b\arcsin(dx^2 + 1) + a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="giac")
[Out] integrate(1/(b*arcsin(d*x^2 + 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a + b\arcsin(1 + dx^2)}\,dx = \int \frac{1}{a + b\,\mathrm{asin}(d\,x^2 + 1)}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1)),x)
[Out] int(1/(a + b*asin(d*x^2 + 1)), x)
```

3.406 $\int \frac{1}{\left(a+b \arcsin \left(1+d x^2\right)\right)^2} d x$

Optimal result

Integrand size = 14, antiderivative size = 205

$$\begin{aligned}\int \frac{1}{\left(a+b \arcsin \left(1+d x^2\right)\right)^2} d x = & -\frac{\sqrt{-2 d x^2-d^2 x^4}}{2 b d x\left(a+b \arcsin \left(1+d x^2\right)\right)} \\ & -\frac{x \operatorname{CosIntegral}\left(\frac{a+b \arcsin \left(1+d x^2\right)}{2 b}\right)\left(\cos \left(\frac{a}{2 b}\right)+\sin \left(\frac{a}{2 b}\right)\right)}{4 b^2\left(\cos \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)\right)} \\ & +\frac{x\left(\cos \left(\frac{a}{2 b}\right)-\sin \left(\frac{a}{2 b}\right)\right) \operatorname{Si}\left(\frac{a+b \arcsin \left(1+d x^2\right)}{2 b}\right)}{4 b^2\left(\cos \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)\right)}\end{aligned}$$

```
[Out] 1/4*x*Si(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b^2/(cos(
1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/4*x*Ci(1/2*(a+b*arcsin(d*x
^2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b^2/(cos(1/2*arcsin(d*x^2+1))-sin(1/2
*arcsin(d*x^2+1)))-1/2*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {4909}

$$\begin{aligned}\int \frac{1}{\left(a+b \arcsin \left(1+d x^2\right)\right)^2} d x = & -\frac{x\left(\sin \left(\frac{a}{2 b}\right)+\cos \left(\frac{a}{2 b}\right)\right) \operatorname{CosIntegral}\left(\frac{a+b \arcsin \left(d x^2+1\right)}{2 b}\right)}{4 b^2\left(\cos \left(\frac{1}{2} \arcsin \left(d x^2+1\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(d x^2+1\right)\right)\right)} \\ & +\frac{x\left(\cos \left(\frac{a}{2 b}\right)-\sin \left(\frac{a}{2 b}\right)\right) \operatorname{Si}\left(\frac{a+b \arcsin \left(d x^2+1\right)}{2 b}\right)}{4 b^2\left(\cos \left(\frac{1}{2} \arcsin \left(d x^2+1\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(d x^2+1\right)\right)\right)} \\ & -\frac{\sqrt{-d^2 x^4-2 d x^2}}{2 b d x\left(a+b \arcsin \left(d x^2+1\right)\right)}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-2),x]
```

```
[Out] -1/2*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])) - (x*CosInt
egral[(a + b*ArcSin[1 + d*x^2])/(2*b)]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(4*b^
2*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + (x*(Cos[a/(2*b)]
 - Sin[a/(2*b)])*SinIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)])/(4*b^2*(Cos[
ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Rule 4909

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-2), x_Symbol] :> Simp[-Sq
rt[-2*c*d*x^2 - d^2*x^4]/(2*b*d*x*(a + b*ArcSin[c + d*x^2])), x] + (-Simp[x
*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c + d
*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x
] + Simp[x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Ar
cSin[c + d*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2
]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{-2dx^2-d^2x^4}}{2bdx\,(a+b\arcsin(1+dx^2))}\\&\quad-\frac{x\,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}\\&\quad+\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 1.16 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.80

$$\int\frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = -\frac{\frac{2b\sqrt{-dx^2(2+dx^2)}}{d(a+b\arcsin(1+dx^2))}+\frac{x^2\left(\text{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)+\left(-\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}}{4b^2x}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-2),x]
```

```
[Out] -1/4*((2*b*Sqrt[-(d*x^2*(2 + d*x^2))])/(d*(a + b*ArcSin[1 + d*x^2])) + (x^2
*(CosIntegral[(a/b + ArcSin[1 + d*x^2])/2]*(Cos[a/(2*b)] + Sin[a/(2*b)]) +
(-Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a/b + ArcSin[1 + d*x^2])/2]))/(
Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))/(b^2*x)
```

Maple [F]

$$\int \frac{1}{\left(a+b \arcsin \left(d \,x^{2}+1\right)\right)^{2}}d x$$

```
[In] int(1/(a+b*arcsin(d*x^2+1))^2,x)
[Out] int(1/(a+b*arcsin(d*x^2+1))^2,x)
```

Fricas [F]

$$\int \frac{1}{\left(a+b \arcsin \left(1+dx^2\right)\right)^2} \, dx=\int \frac{1}{\left(b \arcsin \left(dx^{2}+1\right)+a\right)^{2}} \,d x$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="fricas")
[Out] integral(1/(b^2*arcsin(d*x^2 + 1)^2 + 2*a*b*arcsin(d*x^2 + 1) + a^2), x)
```

Sympy [F]

$$\int \frac{1}{\left(a+b \arcsin \left(1+dx^2\right)\right)^2} \, dx=\int \frac{1}{\left(a+b \operatorname{asin}{\left(dx^{2}+1 \right)}\right)^{2}}\, dx$$

```
[In] integrate(1/(a+b*asin(d*x**2+1))**2,x)
[Out] Integral((a + b*asin(d*x**2 + 1))**(-2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\left(a+b \arcsin \left(1+dx^2\right)\right)^2} \, dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx=\int \frac{1}{(b\arcsin(dx^2+1)+a)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(-2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^2}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^2,x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^2, x)
```

3.407 $\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^3}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 227

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^3}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{4bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^2} + \frac{x}{8b^2\left(a+b\arcsin\left(1+dx^2\right)\right)} + \frac{x\,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

```
[Out] 1/8*x/b^2/(a+b*arcsin(d*x^2+1))+1/16*x*Ci(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos
(1/2*a/b)-sin(1/2*a/b))/b^3/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+
1)))+1/16*x*Si(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b^3
/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/4*(-d^2*x^4-2*d*x^2)
^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used

$= \{4912,\, 4900\}$

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} + \frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} + \frac{x}{8b^2(a+b\arcsin(dx^2+1))} - \frac{\sqrt{-d^2x^4-2dx^2}}{4bdx(a+b\arcsin(dx^2+1))^2}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-3),x]
```

```
[Out] -1/4*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^2) + x/(8*b^
2*(a + b*ArcSin[1 + d*x^2])) + (x*CosIntegral[(a + b*ArcSin[1 + d*x^2])/(2*
b)]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(16*b^3*(Cos[ArcSin[1 + d*x^2]/2] - Sin[
ArcSin[1 + d*x^2]/2])) + (x*(Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a +
b*ArcSin[1 + d*x^2])/(2*b)])/(16*b^3*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin
[1 + d*x^2]/2]))
```

Rule 4900

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{-2dx^2-d^2x^4}}{4bdx(a+b\arcsin(1+dx^2))^2} + \frac{x}{8b^2(a+b\arcsin(1+dx^2))} - \frac{\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx}{8b^2}$$

$$= -\frac{\sqrt{-2dx^2 - d^2x^4}}{4bdx\,(a + b\arcsin(1 + dx^2))^2} + \frac{x}{8b^2\,(a + b\arcsin(1 + dx^2))} + \frac{x\,\mathrm{CosIntegral}\left(\frac{a + b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right) - \sin\left(\frac{a}{2b}\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1 + dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 + dx^2)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right) + \sin\left(\frac{a}{2b}\right)\right)\mathrm{Si}\left(\frac{a + b\arcsin(1+dx^2)}{2b}\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1 + dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 + dx^2)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a + b\arcsin(1 + dx^2))^3}\,dx = -\frac{\sqrt{-dx^2\,(2 + dx^2)}}{4bdx\,(a + b\arcsin(1 + dx^2))^2} + \frac{x}{8b^2\,(a + b\arcsin(1 + dx^2))} + \frac{x\left(\mathrm{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b} + \arcsin(1 + dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right) - \sin\left(\frac{a}{2b}\right)\right) + \left(\cos\left(\frac{a}{2b}\right) + \sin\left(\frac{a}{2b}\right)\right)\mathrm{Si}\left(\frac{1}{2}\left(\frac{a}{b} + \arcsin(\right.\right.\right.}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1 + dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 + dx^2)\right)\right)}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-3),x]
```

```
[Out] -1/4*Sqrt[-(d*x^2*(2 + d*x^2))]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^2) + x/(8*
b^2*(a + b*ArcSin[1 + d*x^2])) + (x*(CosIntegral[(a/b + ArcSin[1 + d*x^2])/
2]*(Cos[a/(2*b)] - Sin[a/(2*b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegra
l[(a/b + ArcSin[1 + d*x^2])/2]))/(16*b^3*(Cos[ArcSin[1 + d*x^2]/2] - Sin[Ar
cSin[1 + d*x^2]/2]))
```

Maple [F]

$$\int \frac{1}{(a + b\arcsin(d\,x^2 + 1))^3}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2+1))^3,x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2+1))^3,x)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^3}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*arcsin(d*x^2 + 1)^3 + 3*a*b^2*arcsin(d*x^2 + 1)^2 + 3*a^2*b
*arcsin(d*x^2 + 1) + a^3), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(dx^2+1))^3}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2+1))**3,x)
```

```
[Out] Integral((a + b*asin(d*x**2 + 1))**(-3), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^3}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(-3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^3}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^3}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^3,x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^3, x)
```

3.408 $\int (a - b \arcsin(1 - dx^2))^4 \, dx$

Optimal result

Integrand size = 16, antiderivative size = 135

$$\int (a - b \arcsin(1 - dx^2))^4 \, dx = 384b^4x - \frac{192b^3\sqrt{2dx^2 - d^2x^4}(a - b \arcsin(1 - dx^2))}{dx} - 48b^2x(a - b \arcsin(1 - dx^2))^2 + \frac{8b\sqrt{2dx^2 - d^2x^4}(a - b \arcsin(1 - dx^2))^3}{dx} + x(a - b \arcsin(1 - dx^2))^4$$

```
[Out] 384*b^4*x-48*b^2*x*(a+b*arcsin(d*x^2-1))^2+x*(a+b*arcsin(d*x^2-1))^4-192*b^
3*(a+b*arcsin(d*x^2-1))*(-d^2*x^4+2*d*x^2)^(1/2)/d/x+8*b*(a+b*arcsin(d*x^2-
1))^3*(-d^2*x^4+2*d*x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4898, 8}

$$\int (a - b \arcsin(1 - dx^2))^4 \, dx = -\frac{192b^3\sqrt{2dx^2 - d^2x^4}(a - b \arcsin(1 - dx^2))}{dx} - 48b^2x(a - b \arcsin(1 - dx^2))^2 + \frac{8b\sqrt{2dx^2 - d^2x^4}(a - b \arcsin(1 - dx^2))^3}{dx} + x(a - b \arcsin(1 - dx^2))^4 + 384b^4x$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^4,x]
```

```
[Out] 384*b^4*x - (192*b^3*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2]))/(d*
x) - 48*b^2*x*(a - b*ArcSin[1 - d*x^2])^2 + (8*b*Sqrt[2*d*x^2 - d^2*x^4]*(a
 - b*ArcSin[1 - d*x^2])^3)/(d*x) + x*(a - b*ArcSin[1 - d*x^2])^4
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{8b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^3}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^4 - \left(48b^2\right)\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx\\ &= -\frac{192b^3\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx} - 48b^2x\left(a-b\arcsin\left(1-dx^2\right)\right)^2 + \frac{8b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^3}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^4 + \left(384b^4\right)\int 1\,dx\\ &= 384b^4x - \frac{192b^3\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx} - 48b^2x\left(a-b\arcsin\left(1-dx^2\right)\right)^2 + \frac{8b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^3}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^4\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 131, normalized size of antiderivative = 0.97

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^4\,dx = \frac{8b\sqrt{-dx^2\left(-2+dx^2\right)}(a-b\arcsin(1-dx^2))^3}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^4 - 48b^2\left(-8b^2x + \frac{4b\sqrt{-dx^2\left(-2+dx^2\right)}(a-b\arcsin(1-dx^2))}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^2\right)$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^4,x]
```

```
[Out] (8*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*(a - b*ArcSin[1 - d*x^2])^3)/(d*x) + x*(a
- b*ArcSin[1 - d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[-(d*x^2*(-2 + d*x^2
))]*(a - b*ArcSin[1 - d*x^2]))/(d*x) + x*(a - b*ArcSin[1 - d*x^2])^2)
```

Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{4}dx$$

```
[In] int((a+b*arcsin(d*x^2-1))^4,x)
```

```
[Out] int((a+b*arcsin(d*x^2-1))^4,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.53

$$\int \left(a-b \arcsin \left(1-dx^2\right)\right)^4 \, dx = \frac{b^4dx^2 \arcsin \left(dx^2-1\right)^4 + 4\,ab^3dx^2 \arcsin \left(dx^2-1\right)^3 + 6\left(a^2b^2-8\,b^4\right)dx^2 \arcsin \left(dx^2-1\right)^2 + 4\left(a^3b-24\,ab^3\right.}{}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="fricas")
```

```
[Out] (b^4*d*x^2*arcsin(d*x^2 - 1)^4 + 4*a*b^3*d*x^2*arcsin(d*x^2 - 1)^3 + 6*(a^2
*b^2 - 8*b^4)*d*x^2*arcsin(d*x^2 - 1)^2 + 4*(a^3*b - 24*a*b^3)*d*x^2*arcsin
(d*x^2 - 1) + (a^4 - 48*a^2*b^2 + 384*b^4)*d*x^2 + 8*(b^4*arcsin(d*x^2 - 1)
^3 + 3*a*b^3*arcsin(d*x^2 - 1)^2 + a^3*b - 24*a*b^3 + 3*(a^2*b^2 - 8*b^4)*a
rcsin(d*x^2 - 1))*sqrt(-d^2*x^4 + 2*d*x^2))/(d*x)
```

Sympy [F]

$$\int \left(a-b \arcsin \left(1-dx^2\right)\right)^4 \, dx = \int \left(a + b \operatorname{asin}{\left(d x^{2} - 1 \right)}\right)^{4}\, dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**4,x)
```

```
[Out] Integral((a + b*asin(d*x**2 - 1))**4, x)
```

Maxima [F]

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^4 \, dx = \int \left(b\arcsin\left(dx^2 - 1\right) + a\right)^4 \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="maxima")
```

```
[Out] b^4*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^4 + 4*(x*arcsin(d*x^2
- 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*a^3*b + a^4*x + in
tegrate(2*(4*sqrt(-d*x^2 + 2)*b^4*sqrt(d)*x*arctan2(d*x^2 - 1, sqrt(-d*x^2
+ 2)*sqrt(d)*x)^3 + 2*(a*b^3*d*x^2 - 2*a*b^3)*arctan2(d*x^2 - 1, sqrt(-d*x^
2 + 2)*sqrt(d)*x)^3 + 3*(a^2*b^2*d*x^2 - 2*a^2*b^2)*arctan2(d*x^2 - 1, sqrt
(-d*x^2 + 2)*sqrt(d)*x)^2)/(d*x^2 - 2), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 617 vs. $2(123) = 246$.

Time = 1.01 (sec) , antiderivative size = 617, normalized size of antiderivative = 4.57

$$\int (a - b\arcsin(1 - dx^2))^4 \, dx = 4\left(x\arcsin(dx^2 - 1) - \frac{2\sqrt{2}\operatorname{sgn}(x)}{\sqrt{d}} + \frac{2\sqrt{-d^2x^2 + 2d}}{d\operatorname{sgn}(x)}\right)a^3b$$

$$+6\left(x\arcsin(dx^2-1)^2 + \frac{2\left(\sqrt{2}\pi\sqrt{d}|d| - 4\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d|d|} + \frac{4\left(\sqrt{-d^2x^2+2d}\arcsin(dx^2-1) + \frac{2\left(\sqrt{2}\sqrt{d}\right.}{}\right.}{d\operatorname{sgn}(x)}\right.$$

$$+2\left(2x\arcsin(dx^2-1)^3 - \frac{3\left(\sqrt{2}\pi^2d^{\frac{3}{2}} + 8\sqrt{2}\pi\sqrt{d}|d| - 32\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d^2} + \frac{12\left(\sqrt{-d^2x^2+2d}\arcsin(d\right.}{}\right.$$

$$+\left(x\arcsin(dx^2-1)^4 + \frac{\left(\sqrt{2}\pi^3\sqrt{d}|d| - 12\sqrt{2}\pi^2d^{\frac{3}{2}} - 96\sqrt{2}\pi\sqrt{d}|d| + 384\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d|d|} + \frac{4\left(2\sqrt{-d^2x^2\right.}{}\right.$$

$$+ a^4x$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="giac")
```

```
[Out] 4*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)/
(d*sgn(x)))*a^3*b + 6*(x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(d)
 - 4*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin(d*
x^2 - 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*a^2*b^
2 + 2*(2*x*arcsin(d*x^2 - 1)^3 - 3*(sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*pi*sqr
t(d)*abs(d) - 32*sqrt(2)*d^(3/2))*sgn(x)/d^2 + 12*(sqrt(-d^2*x^2 + 2*d)*arc
sin(d*x^2 - 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 - d)/d) - 4*(sqrt(2)*
sqrt(d) - sqrt(-d^2*x^2 + 2*d))*d/abs(d) - (sqrt(2)*pi*sqrt(d)*abs(d) - 4*s
qrt(2)*d^(3/2))/abs(d))*d/abs(d))/(d*sgn(x)))*a*b^3 + (x*arcsin(d*x^2 - 1)^
4 + (sqrt(2)*pi^3*sqrt(d)*abs(d) - 12*sqrt(2)*pi^2*d^(3/2) - 96*sqrt(2)*pi*
sqrt(d)*abs(d) + 384*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(2*sqrt(-d^2*x^
2 + 2*d)*arcsin(d*x^2 - 1)^3 - 3*(4*sqrt(d^2*x^2)*arcsin((d^2*x^2 - d)/d)^2
```

```
 + 8*(2*sqrt(-d^2*x^2 + 2*d)*arcsin((d^2*x^2 - d)/d) + 4*(sqrt(2)*sqrt(d) -
 sqrt(d^2*x^2))*d/abs(d) + (sqrt(2)*pi*sqrt(d)*abs(d) - 4*sqrt(2)*d^(3/2))/
abs(d))*d/abs(d) - (sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*pi*sqrt(d)*abs(d) - 32
*sqrt(2)*d^(3/2))/d)*d/abs(d))/(d*sgn(x)))*b^4 + a^4*x
```

Mupad [F(-1)]

Timed out.

$$\int (a - b \arcsin(1 - dx^2))^4 \, dx = \int \left(a + b \operatorname{asin}\left(d x^2 - 1\right)\right)^4 dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^4,x)
```

```
[Out] int((a + b*asin(d*x^2 - 1))^4, x)
```

3.409 $\int (a-b \arcsin(1-dx^2))^3 \, dx$

Optimal result

Integrand size = 16, antiderivative size = 115

$$\int (a-b \arcsin(1-dx^2))^3 \, dx = -24ab^2x - \frac{48b^3\sqrt{2dx^2-d^2x^4}}{dx} + 24b^3x \arcsin(1-dx^2) + \frac{6b\sqrt{2dx^2-d^2x^4}(a-b \arcsin(1-dx^2))^2}{dx} + x(a-b \arcsin(1-dx^2))^3$$

```
[Out] -24*a*b^2*x-24*b^3*x*arcsin(d*x^2-1)+x*(a+b*arcsin(d*x^2-1))^3-48*b^3*(-d^2
*x^4+2*d*x^2)^(1/2)/d/x+6*b*(a+b*arcsin(d*x^2-1))^2*(-d^2*x^4+2*d*x^2)^(1/2
)/d/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4898, 4924, 12, 1602}

$$\int (a-b \arcsin(1-dx^2))^3 \, dx = \frac{6b\sqrt{2dx^2-d^2x^4}(a-b \arcsin(1-dx^2))^2}{dx} + x(a-b \arcsin(1-dx^2))^3 - 24ab^2x + 24b^3x \arcsin(1-dx^2) - \frac{48b^3\sqrt{2dx^2-d^2x^4}}{dx}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^3,x]
```

```
[Out] -24*a*b^2*x - (48*b^3*Sqrt[2*d*x^2 - d^2*x^4])/(d*x) + 24*b^3*x*ArcSin[1 -
d*x^2] + (6*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2])^2)/(d*x) +
x*(a - b*ArcSin[1 - d*x^2])^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1602

```
Int[(Pp_)*(Qq_)^(m_.), x_Symbol] :> With[{p = Expon[Pp, x], q = Expon[Qq, x
]}, Simp[Coeff[Pp, x, p]*x^(p - q + 1)*(Qq^(m + 1)/((p + m*q + 1)*Coeff[Qq,
 x, q])), x] /; NeQ[p + m*q + 1, 0] && EqQ[(p + m*q + 1)*Coeff[Qq, x, q]*Pp
, Coeff[Pp, x, p]*x^(p - q)*((p - q + 1)*Qq + (m + 1)*x*D[Qq, x])]] /; Free
Q[m, x] && PolyQ[Pp, x] && PolyQ[Qq, x] && NeQ[m, -1]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx} \\
&\quad + x\left(a-b\arcsin\left(1-dx^2\right)\right)^3 - \left(24b^2\right)\int\left(a-b\arcsin\left(1-dx^2\right)\right)\,dx \\
&= -24ab^2x + \frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx} \\
&\quad + x\left(a-b\arcsin\left(1-dx^2\right)\right)^3 + \left(24b^3\right)\int\arcsin\left(1-dx^2\right)\,dx \\
&= -24ab^2x + 24b^3x\arcsin\left(1-dx^2\right) + \frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx} \\
&\quad + x\left(a-b\arcsin\left(1-dx^2\right)\right)^3 - \left(24b^3\right)\int-\frac{2dx^2}{\sqrt{2dx^2-d^2x^4}}\,dx \\
&= -24ab^2x + 24b^3x\arcsin\left(1-dx^2\right) + \frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx} \\
&\quad + x\left(a-b\arcsin\left(1-dx^2\right)\right)^3 + \left(48b^3d\right)\int\frac{x^2}{\sqrt{2dx^2-d^2x^4}}\,dx
\end{aligned}$$

$$= -24ab^2x - \frac{48b^3\sqrt{2dx^2-d^2x^4}}{dx} + 24b^3x\arcsin\left(1-dx^2\right) + \frac{6b\sqrt{2dx^2-d^2x^4}(a-b\arcsin\left(1-dx^2\right))^2}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^3$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.44

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx = \frac{a(a^2-24b^2)\,dx^2+6b(a^2-8b^2)\,\sqrt{dx^2\,(2-dx^2)}-3b\Big(a^2dx^2-8b^2dx^2+4ab\sqrt{-dx^2\,(-2+dx^2)}\Big)\arcsin\,(1}{dx}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^3,x]
```

```
[Out] (a*(a^2 - 24*b^2)*d*x^2 + 6*b*(a^2 - 8*b^2)*Sqrt[d*x^2*(2 - d*x^2)] - 3*b*(
a^2*d*x^2 - 8*b^2*d*x^2 + 4*a*b*Sqrt[-(d*x^2*(-2 + d*x^2))])*ArcSin[1 - d*x
^2] + 3*b^2*(a*d*x^2 + 2*b*Sqrt[-(d*x^2*(-2 + d*x^2))])*ArcSin[1 - d*x^2]^2
 - b^3*d*x^2*ArcSin[1 - d*x^2]^3)/(d*x)
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2-1\right)\right)^3dx$$

```
[In] int((a+b*arcsin(d*x^2-1))^3,x)
```

```
[Out] int((a+b*arcsin(d*x^2-1))^3,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.25

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx = \frac{b^3dx^2\arcsin\left(dx^2-1\right)^3+3\,ab^2dx^2\arcsin\left(dx^2-1\right)^2+3\left(a^2b-8\,b^3\right)dx^2\arcsin\left(dx^2-1\right)+\left(a^3-24\,ab^2\right)dx^2}{dx}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="fricas")
```

```
[Out] (b^3*d*x^2*arcsin(d*x^2 - 1)^3 + 3*a*b^2*d*x^2*arcsin(d*x^2 - 1)^2 + 3*(a^2
*b - 8*b^3)*d*x^2*arcsin(d*x^2 - 1) + (a^3 - 24*a*b^2)*d*x^2 + 6*sqrt(-d^2*
x^4 + 2*d*x^2)*(b^3*arcsin(d*x^2 - 1)^2 + 2*a*b^2*arcsin(d*x^2 - 1) + a^2*b
 - 8*b^3))/(d*x)
```

Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)^3\,dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**3,x)
[Out] Integral((a + b*asin(d*x**2 - 1))**3, x)
```

Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^3\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="maxima")
[Out] b^3*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^3 + 3*(x*arcsin(d*x^2
- 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*a^2*b + a^3*x + in
tegrate(3*(2*sqrt(-d*x^2 + 2)*b^3*sqrt(d)*x*arctan2(d*x^2 - 1, sqrt(-d*x^2
+ 2)*sqrt(d)*x)^2 + (a*b^2*d*x^2 - 2*a*b^2)*arctan2(d*x^2 - 1, sqrt(-d*x^2
+ 2)*sqrt(d)*x)^2)/(d*x^2 - 2), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 346 vs. $2(106) = 212$.

Time = 0.65 (sec) , antiderivative size = 346, normalized size of antiderivative = 3.01

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=3\left(x\arcsin\left(dx^2-1\right)-\frac{2\sqrt{2}\mathrm{sgn}(x)}{\sqrt{d}}+\frac{2\sqrt{-d^2x^2+2d}}{d\mathrm{sgn}\left(x\right)}\right)a^2b$$
$$+3\left(x\arcsin\left(dx^2-1\right)^2+\frac{2\left(\sqrt{2}\pi\sqrt{d}|d|-4\sqrt{2}d^{\frac{3}{2}}\right)\mathrm{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2+2d}\arcsin\left(dx^2-1\right)+\frac{2\left(\sqrt{2}\cdots\right.}{\cdots}\right.}{d\mathrm{sgn}\left(x\right)}\cdots\right.$$
$$+\frac{1}{2}\left(2x\arcsin\left(dx^2-1\right)^3-\frac{3\left(\sqrt{2}\pi^2d^{\frac{3}{2}}+8\sqrt{2}\pi\sqrt{d}|d|-32\sqrt{2}d^{\frac{3}{2}}\right)\mathrm{sgn}(x)}{d^2}+\frac{12\left(\sqrt{-d^2x^2+2d}\arcsin\left(\cdots\right.\right.}{\cdots}\cdots\right.$$
$$+a^3x$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="giac")
```

```
[Out] 3*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)/
(d*sgn(x)))*a^2*b + 3*(x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(d)
 - 4*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin(d*
x^2 - 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*a*b^2
+ 1/2*(2*x*arcsin(d*x^2 - 1)^3 - 3*(sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*pi*sqr
t(d)*abs(d) - 32*sqrt(2)*d^(3/2))*sgn(x)/d^2 + 12*(sqrt(-d^2*x^2 + 2*d)*arc
sin(d*x^2 - 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 - d)/d) - 4*(sqrt(2)*
sqrt(d) - sqrt(-d^2*x^2 + 2*d))*d/abs(d) - (sqrt(2)*pi*sqrt(d)*abs(d) - 4*s
qrt(2)*d^(3/2))/abs(d))*d/abs(d))/(d*sgn(x)))*b^3 + a^3*x
```

Mupad [F(-1)]

Timed out.

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^3 \, dx = \int \left(a + b\,\mathrm{asin}\left(d\,x^2 - 1\right)\right)^3 \, dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^3,x)
```

```
[Out] int((a + b*asin(d*x^2 - 1))^3, x)
```

3.410 $\int (a-b\arcsin(1-dx^2))^2\,dx$

Optimal result

Integrand size = 16, antiderivative size = 67

$$\int (a-b\arcsin(1-dx^2))^2\,dx=-8b^2x+\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx}+x(a-b\arcsin(1-dx^2))^2$$

```
[Out] -8*b^2*x+x*(a+b*arcsin(d*x^2-1))^2+4*b*(a+b*arcsin(d*x^2-1))*(-d^2*x^4+2*d*
x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4898, 8}

$$\int (a-b\arcsin(1-dx^2))^2\,dx=\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx}+x(a-b\arcsin(1-dx^2))^2-8b^2x$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^2,x]
```

```
[Out] -8*b^2*x + (4*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2]))/(d*x) +
x*(a - b*ArcSin[1 - d*x^2])^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^2-\left(8b^2\right)\int 1\,dx\\ &= -8b^2x+\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^2\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx = -8b^2x+\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^2$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^2,x]
[Out] -8*b^2*x + (4*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2]))/(d*x) +
x*(a - b*ArcSin[1 - d*x^2])^2
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2-1\right)\right)^2dx$$

```
[In] int((a+b*arcsin(d*x^2-1))^2,x)
[Out] int((a+b*arcsin(d*x^2-1))^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.36

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx = \frac{b^2dx^2\arcsin\left(dx^2-1\right)^2+2\,abdx^2\arcsin\left(dx^2-1\right)+(a^2-8\,b^2)dx^2+4\sqrt{-d^2x^4+2\,dx^2}(b^2\arcsin\left(dx^2-1\right)}{dx}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="fricas")
[Out] (b^2*d*x^2*arcsin(d*x^2 - 1)^2 + 2*a*b*d*x^2*arcsin(d*x^2 - 1) + (a^2 - 8*b
^2)*d*x^2 + 4*sqrt(-d^2*x^4 + 2*d*x^2)*(b^2*arcsin(d*x^2 - 1) + a*b))/(d*x)
```

Sympy [F]

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right)^2 \, dx = \int \left(a + b \operatorname{asin}\left(dx^2 - 1\right)\right)^2 \, dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**2,x)
[Out] Integral((a + b*asin(d*x**2 - 1))**2, x)
```

Maxima [F]

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right)^2 \, dx = \int \left(b \arcsin\left(dx^2 - 1\right) + a\right)^2 \, dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="maxima")
[Out] 2*(x*arcsin(d*x^2 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*
a*b + (x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^2 + 4*sqrt(d)*integ
rate(sqrt(-d*x^2 + 2)*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)/(d*x
^2 - 2), x))*b^2 + a^2*x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 160 vs. $2(61) = 122$.

Time = 0.44 (sec) , antiderivative size = 160, normalized size of antiderivative = 2.39

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right)^2 \, dx = 2 \left(x \arcsin\left(dx^2 - 1\right) - \frac{2\sqrt{2}\operatorname{sgn}(x)}{\sqrt{d}} + \frac{2\sqrt{-d^2x^2 + 2d}}{d\operatorname{sgn}(x)}\right) ab + \left(x \arcsin\left(dx^2 - 1\right)^2 + \frac{2\left(\sqrt{2}\pi\sqrt{d}|d| - 4\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d|d|} + \frac{4\left(\sqrt{-d^2x^2 + 2d}\arcsin\left(dx^2 - 1\right) + \frac{2\left(\sqrt{2}\sqrt{d} \cdots\right.}{\cdots}\right.}{d\operatorname{sgn}(x)} \cdots\right) + a^2x$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="giac")
[Out] 2*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)/
(d*sgn(x)))*a*b + (x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(d) - 4
*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin(d*x^2
- 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*b^2 + a^2*
x
```

Mupad [F(-1)]

Timed out.

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right)^2 dx = \int \left(a + b \operatorname{asin}\left(d x^2 - 1\right)\right)^2 dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^2,x)
[Out] int((a + b*asin(d*x^2 - 1))^2, x)
```

3.411 $\int (a-b\arcsin(1-dx^2))\,dx$

Optimal result

Integrand size = 14, antiderivative size = 45

$$\int (a-b\arcsin(1-dx^2))\,dx = ax+\frac{2b\sqrt{2dx^2-d^2x^4}}{dx}-bx\arcsin(1-dx^2)$$

```
[Out] a*x+b*x*arcsin(d*x^2-1)+2*b*(-d^2*x^4+2*d*x^2)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4924, 12, 1602}

$$\int (a-b\arcsin(1-dx^2))\,dx = ax+b(-x)\arcsin(1-dx^2)+\frac{2b\sqrt{2dx^2-d^2x^4}}{dx}$$

```
[In] Int[a - b*ArcSin[1 - d*x^2],x]
```

```
[Out] a*x + (2*b*Sqrt[2*d*x^2 - d^2*x^4])/(d*x) - b*x*ArcSin[1 - d*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1602

```
Int[(Pp_)*(Qq_)^(m_.), x_Symbol] :> With[{p = Expon[Pp, x], q = Expon[Qq, x
]}, Simp[Coeff[Pp, x, p]*x^(p - q + 1)*(Qq^(m + 1)/((p + m*q + 1)*Coeff[Qq,
 x, q])), x] /; NeQ[p + m*q + 1, 0] && EqQ[(p + m*q + 1)*Coeff[Qq, x, q]*Pp
, Coeff[Pp, x, p]*x^(p - q)*((p - q + 1)*Qq + (m + 1)*x*D[Qq, x])]] /; Free
```

```
Q[m, x] && PolyQ[Pp, x] && PolyQ[Qq, x] && NeQ[m, -1]
```

Rule 4924

```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= ax - b\int \arcsin\left(1-dx^2\right)\,dx \\
&= ax - bx\arcsin\left(1-dx^2\right) + b\int -\frac{2dx^2}{\sqrt{2dx^2-d^2x^4}}\,dx \\
&= ax - bx\arcsin\left(1-dx^2\right) - (2bd)\int \frac{x^2}{\sqrt{2dx^2-d^2x^4}}\,dx \\
&= ax + \frac{2b\sqrt{2dx^2-d^2x^4}}{dx} - bx\arcsin\left(1-dx^2\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.96

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx = ax + \frac{2b\sqrt{-dx^2\left(-2+dx^2\right)}}{dx} - bx\arcsin\left(1-dx^2\right)$$

```
[In] Integrate[a - b*ArcSin[1 - d*x^2],x]
[Out] a*x + (2*b*Sqrt[-(d*x^2*(-2 + d*x^2))])/(d*x) - b*x*ArcSin[1 - d*x^2]
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

method	result	size
default	$ax+b\left(x\arcsin\left(d\,x^2-1\right)-\frac{2x\left(d\,x^2-2\right)}{\sqrt{-d^2x^4+2d\,x^2}}\right)$	45
parts	$ax+b\left(x\arcsin\left(d\,x^2-1\right)-\frac{2x\left(d\,x^2-2\right)}{\sqrt{-d^2x^4+2d\,x^2}}\right)$	45

```
[In] int(a+b*arcsin(d*x^2-1),x,method=_RETURNVERBOSE)
[Out] a*x+b*(x*arcsin(d*x^2-1)-2/(-d^2*x^4+2*d*x^2)^(1/2)*x*(d*x^2-2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.07

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right) \, dx = \frac{bdx^2 \arcsin\left(dx^2 - 1\right) + adx^2 + 2\sqrt{-d^2x^4 + 2\,dx^2}b}{dx}$$

```
[In] integrate(a+b*arcsin(d*x^2-1),x, algorithm="fricas")
[Out] (b*d*x^2*arcsin(d*x^2 - 1) + a*d*x^2 + 2*sqrt(-d^2*x^4 + 2*d*x^2)*b)/(d*x)
```

Sympy [F]

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right) \, dx = \int \left(a + b \operatorname{asin}\left(dx^2 - 1\right)\right) \, dx$$

```
[In] integrate(a+b*asin(d*x**2-1),x)
[Out] Integral(a + b*asin(d*x**2 - 1), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right) \, dx = \left(x \arcsin\left(dx^2 - 1\right) - \frac{2\left(d^{\frac{3}{2}}x^2 - 2\sqrt{d}\right)}{\sqrt{-dx^2 + 2}d}\right)b + ax$$

```
[In] integrate(a+b*arcsin(d*x^2-1),x, algorithm="maxima")
[Out] (x*arcsin(d*x^2 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*b
+ a*x
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.11

$$\int \left(a - b \arcsin\left(1 - dx^2\right)\right) \, dx = \left(x \arcsin\left(dx^2 - 1\right) - \frac{2\sqrt{2}\mathrm{sgn}(x)}{\sqrt{d}} + \frac{2\sqrt{-d^2x^2 + 2\,d}}{d\mathrm{sgn}\left(x\right)}\right)b + ax$$

```
[In] integrate(a+b*arcsin(d*x^2-1),x, algorithm="giac")
[Out] (x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)/(d
*sgn(x)))*b + a*x
```

Mupad [B] (verification not implemented)

Time = 0.50 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.87

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)\,dx = a\,x + b\,x\,\mathrm{asin}\left(d\,x^2 - 1\right) + \frac{2\,b\,\sqrt{1 - \left(d\,x^2 - 1\right)^2}}{d\,x}$$

```
[In] int(a + b*asin(d*x^2 - 1),x)
[Out] a*x + b*x*asin(d*x^2 - 1) + (2*b*(1 - (d*x^2 - 1)^2)^(1/2))/(d*x)
```

3.412 $\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 168

$$\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx = \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] -1/2*x*Si(1/2*a/b+1/2*arcsin(d*x^2-1))*(cos(1/2*a/b)-sin(1/2*a/b))/b/(cos(1
/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+1/2*x*Ci(1/2*(-a-b*arcsin(d*x
^2-1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*a
rcsin(d*x^2-1)))
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4900}

$$\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx = \frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-1),x]
```

```
[Out] (x*CosIntegral[-1/2*(a - b*ArcSin[1 - d*x^2])/b]*(Cos[a/(2*b)] + Sin[a/(2*b
)]))/(2*b*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) - (x*(Cos[
```

```
a/(2*b)] - Sin[a/(2*b)])*SinIntegral[a/(2*b) - ArcSin[1 - d*x^2]/2])/(2*b*(
Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Rule 4900

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.77

$$\int \frac{1}{a-b\arcsin\left(1-dx^2\right)}\,dx = \frac{\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)\left(\text{CosIntegral}\left(\frac{1}{2}\left(-\frac{a}{b}+\arcsin\left(1-dx^2\right)\right)\right)\left(\cos\left(\frac{a}{2b}\right)+\text{s}\right.\right.}{2bdx}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-1),x]
```

```
[Out] ((Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b)
 + ArcSin[1 - d*x^2])/2]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + (-Cos[a/(2*b)] + S
in[a/(2*b)])*SinIntegral[(a - b*ArcSin[1 - d*x^2])/(2*b)]))/(2*b*d*x)
```

Maple [F]

$$\int \frac{1}{a+b\arcsin\left(d\,x^2-1\right)}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2-1)),x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2-1)),x)
```

Fricas [F]

$$\int \frac{1}{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \frac{1}{b\arcsin\left(dx^2-1\right)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="fricas")
[Out] integral(1/(b*arcsin(d*x^2 - 1) + a), x)
```

Sympy [F]

$$\int \frac{1}{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\left(dx^2-1\right)}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2-1)),x)
[Out] Integral(1/(a + b*asin(d*x**2 - 1)), x)
```

Maxima [F]

$$\int \frac{1}{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \frac{1}{b\arcsin\left(dx^2-1\right)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="maxima")
[Out] integrate(1/(b*arcsin(d*x^2 - 1) + a), x)
```

Giac [F]

$$\int \frac{1}{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \frac{1}{b\arcsin\left(dx^2-1\right)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="giac")
[Out] integrate(1/(b*arcsin(d*x^2 - 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx = \int \frac{1}{a+b\,\mathrm{asin}\left(d\,x^2-1\right)}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1)),x)
[Out] int(1/(a + b*asin(d*x^2 - 1)), x)
```

3.413 $\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 216

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{2bdx(a-b\arcsin(1-dx^2))} - \frac{x\,\mathrm{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\mathrm{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] -1/4*x*Ci(1/2*(-a-b*arcsin(d*x^2-1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b^2/(co
s(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/4*x*Si(1/2*a/b+1/2*arcsi
n(d*x^2-1))*(cos(1/2*a/b)+sin(1/2*a/b))/b^2/(cos(1/2*arcsin(d*x^2-1))+sin(1
/2*arcsin(d*x^2-1)))-1/2*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2-1
))
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4909}

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx = -\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\mathrm{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\mathrm{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{\sqrt{2dx^2-d^2x^4}}{2bdx(a-b\arcsin(1-dx^2))}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-2),x]
```

```
[Out] -1/2*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])) - (x*CosInte
gral[-1/2*(a - b*ArcSin[1 - d*x^2])/b]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(4*b^
2*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) - (x*(Cos[a/(2*b)]
 + Sin[a/(2*b)])*SinIntegral[a/(2*b) - ArcSin[1 - d*x^2]/2])/(4*b^2*(Cos[Ar
cSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Rule 4909

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-2), x_Symbol] :> Simp[-Sq
rt[-2*c*d*x^2 - d^2*x^4]/(2*b*d*x*(a + b*ArcSin[c + d*x^2])), x] + (-Simp[x
*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c + d
*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x
] + Simp[x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Ar
cSin[c + d*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2
]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} = &-\frac{\sqrt{2dx^2-d^2x^4}}{2bdx\,(a-b\arcsin(1-dx^2))} \\
&-\frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} \\
&-\frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.85

$$
\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx = \frac{2b\sqrt{dx^2(2-dx^2)}+(a-b\arcsin(1-dx^2))\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)\left(\text{CosInteg}\right.}{4b^2dx\,(-a+b\arcsin}
$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-2),x]
```

```
[Out] (2*b*Sqrt[d*x^2*(2 - d*x^2)] + (a - b*ArcSin[1 - d*x^2])*(Cos[ArcSin[1 - d*
x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b) + ArcSin[1 - d*x^2
])/2]*(Cos[a/(2*b)] - Sin[a/(2*b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinInte
gral[(a - b*ArcSin[1 - d*x^2])/(2*b)]))/(4*b^2*d*x*(-a + b*ArcSin[1 - d*x^2
]))
```

Maple [F]

$$\int \frac{1}{\left(a+b \arcsin \left(d\,x^{2}-1\right)\right)^{2}}d x$$

```
[In] int(1/(a+b*arcsin(d*x^2-1))^2,x)
[Out] int(1/(a+b*arcsin(d*x^2-1))^2,x)
```

Fricas [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="fricas")
[Out] integral(1/(b^2*arcsin(d*x^2 - 1)^2 + 2*a*b*arcsin(d*x^2 - 1) + a^2), x)
```

Sympy [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)^2}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2-1))**2,x)
[Out] Integral((a + b*asin(d*x**2 - 1))**(-2), x)
```

Maxima [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="maxima")
[Out] 1/2*(2*(b^2*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*b*d)*sqrt(
d)*integrate(1/2*sqrt(-d*x^2 + 2)*x/(a*b*d*x^2 - 2*a*b + (b^2*d*x^2 - 2*b^2
)*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)), x) - sqrt(-d*x^2 + 2)*sq
rt(d))/(b^2*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*b*d)
```

Giac [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^2}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1))^2,x)
[Out] int(1/(a + b*asin(d*x^2 - 1))^2, x)
```

3.414 $\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 240

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{4bdx(a-b\arcsin(1-dx^2))^2} + \frac{x}{8b^2(a-b\arcsin(1-dx^2))} - \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] 1/8*x/b^2/(a+b*arcsin(d*x^2-1))+1/16*x*Si(1/2*a/b+1/2*arcsin(d*x^2-1))*(cos
(1/2*a/b)-sin(1/2*a/b))/b^3/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-
1)))-1/16*x*Ci(1/2*(-a-b*arcsin(d*x^2-1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b^
3/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/4*(-d^2*x^4+2*d*x^2
)^(1/2)/b/d/x/(a+b*arcsin(d*x^2-1))^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used

$= \{4912, 4900\}$

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = -\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} + \frac{x}{8b^2(a-b\arcsin(1-dx^2))} - \frac{\sqrt{2dx^2-d^2x^4}}{4bdx(a-b\arcsin(1-dx^2))^2}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-3),x]
```

```
[Out] -1/4*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^2) + x/(8*b^2
*(a - b*ArcSin[1 - d*x^2])) - (x*CosIntegral[-1/2*(a - b*ArcSin[1 - d*x^2])
/b]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(16*b^3*(Cos[ArcSin[1 - d*x^2]/2] - Sin[
ArcSin[1 - d*x^2]/2])) + (x*(Cos[a/(2*b)] - Sin[a/(2*b)])*SinIntegral[a/(2*
b) - ArcSin[1 - d*x^2]/2])/(16*b^3*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1
 - d*x^2]/2]))
```

Rule 4900

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{2dx^2-d^2x^4}}{4bdx(a-b\arcsin(1-dx^2))^2} + \frac{x}{8b^2(a-b\arcsin(1-dx^2))} - \frac{\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx}{8b^2}$$

$$= -\frac{\sqrt{2dx^2-d^2x^4}}{4bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^2}+\frac{x}{8b^2\left(a-b\arcsin\left(1-dx^2\right)\right)} - \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 195, normalized size of antiderivative = 0.81

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx = -\frac{\frac{4b^2\sqrt{-dx^2(-2+dx^2)}}{d(a-b\arcsin(1-dx^2))^2}-\frac{2bx^2}{a-b\arcsin(1-dx^2)}+\frac{\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)\left(\text{CosIntegral}\left(\frac{1}{2}\left(-\frac{a}{b}+\arcsin(1-dx^2)\right)\right)\left(\right.\right.}{d}}{16b^3x}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-3),x]
```

```
[Out] -1/16*((4*b^2*Sqrt[-(d*x^2*(-2 + d*x^2))])/(d*(a - b*ArcSin[1 - d*x^2])^2)
- (2*b*x^2)/(a - b*ArcSin[1 - d*x^2]) + ((Cos[ArcSin[1 - d*x^2]/2] - Sin[Ar
cSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b) + ArcSin[1 - d*x^2])/2]*(Cos[a/(2*
b)] + Sin[a/(2*b)]) + (-Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a - b*Arc
Sin[1 - d*x^2])/(2*b)]))/d)/(b^3*x)
```

Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^2-1\right)\right)^3}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2-1))^3,x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2-1))^3,x)
```

Fricas [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^3}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*arcsin(d*x^2 - 1)^3 + 3*a*b^2*arcsin(d*x^2 - 1)^2 + 3*a^2*b
*arcsin(d*x^2 - 1) + a^3), x)
```

Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(dx^2-1))^3}\,dx$$

[In] integrate(1/(a+b*asin(d*x**2-1))**3,x)

[Out] Integral((a + b*asin(d*x**2 - 1))**(-3), x)

Maxima [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = \int \frac{1}{(b\arcsin(dx^2-1)+a)^3}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="maxima")

[Out] 1/8*(b*d*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*d*x - 2*sqrt(-d*x^2 + 2)*b*sqrt(d) - 8*(b^4*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^2 + 2*a*b^3*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a^2*b^2*d)*integrate(1/8/(b^3*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*b^2), x))/(b^4*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^2 + 2*a*b^3*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a^2*b^2*d)

Giac [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = \int \frac{1}{(b\arcsin(dx^2-1)+a)^3}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="giac")

[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-3), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(d\,x^2-1))^3}\,dx$$

[In] int(1/(a + b*asin(d*x^2 - 1))^3,x)

[Out] int(1/(a + b*asin(d*x^2 - 1))^3, x)

3.415 $\int \arcsin(1+x^2)^2\,dx$

Optimal result

Integrand size = 8, antiderivative size = 40

$$\int \arcsin(1+x^2)^2\,dx = -8x+\frac{4\sqrt{-2x^2-x^4}\arcsin(1+x^2)}{x}+x\arcsin(1+x^2)^2$$

```
[Out] -8*x+x*arcsin(x^2+1)^2+4*arcsin(x^2+1)*(-x^4-2*x^2)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.00 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4898, 8}

$$\int \arcsin(1+x^2)^2\,dx = x\arcsin(x^2+1)^2+\frac{4\sqrt{-x^4-2x^2}\arcsin(x^2+1)}{x}-8x$$

```
[In] Int[ArcSin[1 + x^2]^2,x]
```

```
[Out] -8*x + (4*Sqrt[-2*x^2 - x^4]*ArcSin[1 + x^2])/x + x*ArcSin[1 + x^2]^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
```

```
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{4\sqrt{-2x^2-x^4}\arcsin(1+x^2)}{x}+x\arcsin\left(1+x^2\right)^2-8\int 1\,dx\\ &= -8x+\frac{4\sqrt{-2x^2-x^4}\arcsin(1+x^2)}{x}+x\arcsin\left(1+x^2\right)^2\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00

$$\int \arcsin\left(1+x^2\right)^2\,dx=-8x+\frac{4\sqrt{-2x^2-x^4}\arcsin(1+x^2)}{x}+x\arcsin\left(1+x^2\right)^2$$

```
[In] Integrate[ArcSin[1 + x^2]^2,x]
[Out] -8*x + (4*Sqrt[-2*x^2 - x^4]*ArcSin[1 + x^2])/x + x*ArcSin[1 + x^2]^2
```

Maple [F]

$$\int \arcsin\left(x^2+1\right)^2dx$$

```
[In] int(arcsin(x^2+1)^2,x)
[Out] int(arcsin(x^2+1)^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.08

$$\int \arcsin\left(1+x^2\right)^2\,dx=\frac{x^2\arcsin\left(x^2+1\right)^2-8\,x^2+4\,\sqrt{-x^4-2\,x^2}\arcsin\left(x^2+1\right)}{x}$$

```
[In] integrate(arcsin(x^2+1)^2,x, algorithm="fricas")
[Out] (x^2*arcsin(x^2 + 1)^2 - 8*x^2 + 4*sqrt(-x^4 - 2*x^2)*arcsin(x^2 + 1))/x
```

Sympy [F]

$$\int \arcsin\left(1+x^2\right)^2\,dx=\int \operatorname{asin}^2\left(x^2+1\right)dx$$

```
[In] integrate(asin(x**2+1)**2,x)
```

```
[Out] Integral(asin(x**2 + 1)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \arcsin\left(1+x^2\right)^2\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x^2+1)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \arcsin\left(1+x^2\right)^2\,dx=\int \arcsin\left(x^2+1\right)^2\,dx$$

```
[In] integrate(arcsin(x^2+1)^2,x, algorithm="giac")
```

```
[Out] integrate(arcsin(x^2 + 1)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \arcsin\left(1+x^2\right)^2\,dx=\int \operatorname{asin}\left(x^2+1\right)^2dx$$

```
[In] int(asin(x^2 + 1)^2,x)
```

```
[Out] int(asin(x^2 + 1)^2, x)
```

3.416 $\int \arcsin(1-x^2)^2\,dx$

Optimal result

Integrand size = 10, antiderivative size = 44

$$\int \arcsin\left(1-x^2\right)^2\,dx=-8x-\frac{4\sqrt{2x^2-x^4}\arcsin\left(1-x^2\right)}{x}+x\arcsin\left(1-x^2\right)^2$$

```
[Out] -8*x+x*arcsin(x^2-1)^2+4*arcsin(x^2-1)*(-x^4+2*x^2)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4898, 8}

$$\int \arcsin\left(1-x^2\right)^2\,dx=x\arcsin\left(1-x^2\right)^2-\frac{4\sqrt{2x^2-x^4}\arcsin\left(1-x^2\right)}{x}-8x$$

```
[In] Int[ArcSin[1 - x^2]^2,x]
```

```
[Out] -8*x - (4*Sqrt[2*x^2 - x^4]*ArcSin[1 - x^2])/x + x*ArcSin[1 - x^2]^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
```

```
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\text{integral} = -\frac{4\sqrt{2x^2-x^4}\arcsin(1-x^2)}{x} + x\arcsin\left(1-x^2\right)^2 - 8\int 1\,dx$$
$$= -8x - \frac{4\sqrt{2x^2-x^4}\arcsin(1-x^2)}{x} + x\arcsin\left(1-x^2\right)^2$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \arcsin\left(1-x^2\right)^2\,dx = -8x - \frac{4\sqrt{2x^2-x^4}\arcsin(1-x^2)}{x} + x\arcsin\left(1-x^2\right)^2$$

```
[In] Integrate[ArcSin[1 - x^2]^2,x]
[Out] -8*x - (4*Sqrt[2*x^2 - x^4]*ArcSin[1 - x^2])/x + x*ArcSin[1 - x^2]^2
```

Maple [F]

$$\int \arcsin\left(x^2-1\right)^2\,dx$$

```
[In] int(arcsin(x^2-1)^2,x)
[Out] int(arcsin(x^2-1)^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.98

$$\int \arcsin\left(1-x^2\right)^2\,dx = \frac{x^2\arcsin\left(x^2-1\right)^2 - 8\,x^2 + 4\sqrt{-x^4+2\,x^2}\arcsin\left(x^2-1\right)}{x}$$

```
[In] integrate(arcsin(x^2-1)^2,x, algorithm="fricas")
[Out] (x^2*arcsin(x^2 - 1)^2 - 8*x^2 + 4*sqrt(-x^4 + 2*x^2)*arcsin(x^2 - 1))/x
```

Sympy [F]

$$\int \arcsin\left(1-x^2\right)^2\,dx = \int \operatorname{asin}^2\left(x^2-1\right)\,dx$$

```
[In] integrate(asin(x**2-1)**2,x)
```

```
[Out] Integral(asin(x**2 - 1)**2, x)
```

Maxima [F]

$$\int \arcsin\left(1-x^2\right)^2\,dx = \int \arcsin\left(x^2-1\right)^2\,dx$$

```
[In] integrate(arcsin(x^2-1)^2,x, algorithm="maxima")
```

```
[Out] x*arctan2(x^2 - 1, sqrt(-x^2 + 2)*x)^2 + 4*integrate(sqrt(-x^2 + 2)*x*arcta
n2(x^2 - 1, sqrt(-x^2 + 2)*x)/(x^2 - 2), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.32

$$\int \arcsin\left(1-x^2\right)^2\,dx = x\arcsin\left(x^2-1\right)^2 + 2\left(\sqrt{2}\pi - 4\sqrt{2}\right)\operatorname{sgn}(x) + \frac{4\left(\sqrt{-x^2+2}\arcsin\left(x^2-1\right) + 2\sqrt{2} - 2|x|\right)}{\operatorname{sgn}(x)}$$

```
[In] integrate(arcsin(x^2-1)^2,x, algorithm="giac")
```

```
[Out] x*arcsin(x^2 - 1)^2 + 2*(sqrt(2)*pi - 4*sqrt(2))*sgn(x) + 4*(sqrt(-x^2 + 2)
*arcsin(x^2 - 1) + 2*sqrt(2) - 2*abs(x))/sgn(x)
```

Mupad [F(-1)]

Timed out.

$$\int \arcsin\left(1-x^2\right)^2\,dx = \int \operatorname{asin}{\left(x^2-1\right)}^2\,dx$$

```
[In] int(asin(x^2 - 1)^2,x)
```

```
[Out] int(asin(x^2 - 1)^2, x)
```

3.417 $\int (a+b\arcsin(1+dx^2))^{5/2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 277

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=-15b^2x\sqrt{a+b\arcsin\left(1+dx^2\right)}+\frac{5b\sqrt{-2dx^2-d^2x^4}\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}{dx}+x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}-\frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}+\frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

```
[Out] x*(a+b*arcsin(d*x^2+1))^(5/2)-15*x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+1
))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(1/b)^(5/2)/(cos(1/
2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+15*x*FresnelC((1/b)^(1/2)*(a+b
*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(1/b
)^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+5*b*(a+b*arcsin
(d*x^2+1))^(3/2)*(-d^2*x^4-2*d*x^2)^(1/2)/d/x-15*b^2*x*(a+b*arcsin(d*x^2+1)
)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4898, 4895}

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2} dx = -15b^2x\sqrt{a+b\arcsin\left(dx^2+1\right)} + \frac{5b\sqrt{-d^2x^4-2dx^2}\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}}{dx} + \frac{15\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)} - \frac{15\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)} + x\left(a+b\arcsin\left(dx^2+1\right)\right)^{5/2}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(5/2),x]
```

```
[Out] -15*b^2*x*Sqrt[a + b*ArcSin[1 + d*x^2]] + (5*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a
+ b*ArcSin[1 + d*x^2])^(3/2))/(d*x) + x*(a + b*ArcSin[1 + d*x^2])^(5/2) - (
15*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi
]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/((b^(-1))^(5/2)*(Cos[ArcSin[1 + d*x^2]/2]
 - Sin[ArcSin[1 + d*x^2]/2])) + (15*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[
a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/((b^(-1)
)^(5/2)*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Rule 4895

```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
```

```
2, 1] && GtQ[n, 1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{5b\sqrt{-2dx^2-d^2x^4}\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}{dx} \\
&\quad + x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2} - \left(15b^2\right)\int\sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx \\
&= -15b^2x\sqrt{a+b\arcsin\left(1+dx^2\right)} \\
&\quad + \frac{5b\sqrt{-2dx^2-d^2x^4}\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2} \\
&\quad - \frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} \\
&\quad + \frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.97

$$
\int\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx = \frac{5b\sqrt{-dx^2\left(2+dx^2\right)}\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}{dx}
$$

$$
+ x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}
$$

$$
- \frac{15x\left(\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\right.\right.}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right.}
$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(5/2),x]
```

```
[Out] (5*b*Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^(3/2))/(d*x) + x*
(a + b*ArcSin[1 + d*x^2])^(5/2) - (15*x*(Sqrt[Pi]*FresnelS[(Sqrt[b^(-1)]*Sq
rt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]) - Sqrt
[Pi]*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a
/(2*b)] + Sin[a/(2*b)]) + Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]]*(Cos[A
rcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])))/((b^(-1))^(5/2)*(Cos[ArcS
in[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^{2}+1\right)\right)^{\frac{5}{2}}dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^(5/2),x)
[Out] int((a+b*arcsin(d*x^2+1))^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**(5/2),x)
[Out] Integral((a + b*asin(d*x**2 + 1))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=\int \left(b\arcsin\left(dx^2+1\right)+a\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^{5/2}\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^(5/2),x)
[Out] int((a + b*asin(d*x^2 + 1))^(5/2), x)
```

3.418 $\int (a+b\arcsin(1+dx^2))^{3/2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 247

$$\int (a+b\arcsin(1+dx^2))^{3/2}\,dx=\frac{3b\sqrt{-2dx^2-d^2x^4}\sqrt{a+b\arcsin(1+dx^2)}}{dx}+x(a+b\arcsin(1+dx^2))^{3/2}+\frac{3b^{3/2}\sqrt{\pi}x\,\mathrm{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}+\frac{3b^{3/2}\sqrt{\pi}x\,\mathrm{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

```
[Out] x*(a+b*arcsin(d*x^2+1))^(3/2)+3*b^(3/2)*x*FresnelC((a+b*arcsin(d*x^2+1))^(1
/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(
d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+3*b^(3/2)*x*FresnelS((a+b*arcsin(d*x^2+
1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*a
rcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+3*b*(-d^2*x^4-2*d*x^2)^(1/2)*(a+b
*arcsin(d*x^2+1))^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used

$= \{4898, 4903\}$

$$\int (a + b \arcsin(1+dx^2))^{3/2}\, dx = \frac{3\sqrt{\pi} b^{3/2} x \left(\cos\left(\frac{a}{2b}\right) - \sin\left(\frac{a}{2b}\right)\right) \text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right) - \sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)} + \frac{3\sqrt{\pi} b^{3/2} x \left(\sin\left(\frac{a}{2b}\right) + \cos\left(\frac{a}{2b}\right)\right) \text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right) - \sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)} + \frac{3b\sqrt{-d^2x^4 - 2dx^2}\sqrt{a + b\arcsin(dx^2+1)}}{dx} + x\left(a + b\arcsin(dx^2+1)\right)^{3/2}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(3/2),x]
```

```
[Out] (3*b*Sqrt[-2*d*x^2 - d^2*x^4]*Sqrt[a + b*ArcSin[1 + d*x^2]])/(d*x) + x*(a +
 b*ArcSin[1 + d*x^2])^(3/2) + (3*b^(3/2)*Sqrt[Pi]*x*FresnelC[Sqrt[a + b*Arc
Sin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[Arc
Sin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) + (3*b^(3/2)*Sqrt[Pi]*x*Fresn
elS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a
/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = \frac{3b\sqrt{-2dx^2 - d^2x^4}\sqrt{a + b\arcsin(1+dx^2)}}{dx} + x\left(a + b\arcsin(1+dx^2)\right)^{3/2} - (3b^2)\int \frac{1}{\sqrt{a + b\arcsin(1+dx^2)}}\, dx$$

$$= \frac{3b\sqrt{-2dx^2-d^2x^4}\sqrt{a+b\arcsin(1+dx^2)}}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}$$
$$+ \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$
$$+ \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.01

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx = \frac{\sqrt{a+b\arcsin(1+dx^2)}\left(adx^2+3b\sqrt{-dx^2(2+dx^2)}+bdx^2\arcsin(1+dx^2)\right)}{dx}$$
$$+ \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$
$$+ \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(3/2),x]
[Out] (Sqrt[a + b*ArcSin[1 + d*x^2]]*(a*d*x^2 + 3*b*Sqrt[-(d*x^2*(2 + d*x^2))] +
b*d*x^2*ArcSin[1 + d*x^2]))/(d*x) + (3*b^(3/2)*Sqrt[Pi]*x*FresnelC[Sqrt[a +
 b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(C
os[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) + (3*b^(3/2)*Sqrt[Pi]*x
*FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] +
 Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2+1\right)\right)^{\frac{3}{2}}dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^(3/2),x)
[Out] int((a+b*arcsin(d*x^2+1))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**(3/2),x)
[Out] Integral((a + b*asin(d*x**2 + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx=\int \left(b\arcsin\left(dx^2+1\right)+a\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^(3/2),x)
[Out] int((a + b*asin(d*x^2 + 1))^(3/2), x)
```

3.419 $\int \sqrt{a+b\arcsin(1+dx^2)}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 210

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx = x\sqrt{a+b\arcsin(1+dx^2)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

```
[Out] x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-
sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))/
(1/b)^(1/2)-x*FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(c
os(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin
(d*x^2+1)))/(1/b)^(1/2)+x*(a+b*arcsin(d*x^2+1))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used

$= \{4895\}$

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = -\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)} + \frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)} + x\sqrt{a+b\arcsin\left(dx^2+1\right)}$$

```
[In] Int[Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

```
[Out] x*Sqrt[a + b*ArcSin[1 + d*x^2]] + (Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a
 + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b^(
-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) - (Sqrt[Pi]*x*F
resnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)
] + Sin[a/(2*b)]))/(Sqrt[b^(-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 +
 d*x^2]/2]))
```

Rule 4895

```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = x\sqrt{a+b\arcsin\left(1+dx^2\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.99

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx = \frac{x\left(\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)\right.\right.}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\right.}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

```
[Out] (x*(Sqrt[Pi]*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]
]*(Cos[a/(2*b)] - Sin[a/(2*b)]) - Sqrt[Pi]*FresnelC[(Sqrt[b^(-1)]*Sqrt[a +
b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[b^(-1)
]*Sqrt[a + b*ArcSin[1 + d*x^2]]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 +
d*x^2]/2])))/(Sqrt[b^(-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2
]/2]))
```

Maple [F]

$$\int \sqrt{a+b\arcsin\left(d\,x^{2}+1\right)}dx$$

```
[In] int((a+b*arcsin(d*x^2+1))^(1/2),x)
```

```
[Out] int((a+b*arcsin(d*x^2+1))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = \int \sqrt{a+b\operatorname{asin}\left(dx^2+1\right)}\,dx$$

```
[In] integrate((a+b*asin(d*x**2+1))**(1/2),x)
[Out] Integral(sqrt(a + b*asin(d*x**2 + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = \int \sqrt{b\arcsin\left(dx^2+1\right)+a}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*arcsin(d*x^2 + 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = \int \sqrt{a+b\operatorname{asin}\left(d\,x^2+1\right)}\,dx$$

```
[In] int((a + b*asin(d*x^2 + 1))^(1/2),x)
[Out] int((a + b*asin(d*x^2 + 1))^(1/2), x)
```

3.420 $\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 185

$$\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx = -\frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

```
[Out] -x*FresnelC((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin
(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))/b^(
1/2)-x*FresnelS((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)
+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))
/b^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4903}

$$\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx = -\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} - \frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}$$

```
[In] Int[1/Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

```
[Out] -((Sqrt[Pi]*x*FresnelC[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(C
os[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSi
n[1 + d*x^2]/2]))) - (Sqrt[Pi]*x*FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sq
rt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*
x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} \\ &\quad -\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.77

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx = -\frac{\sqrt{\pi}x\left(\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

```
[In] Integrate[1/Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

```
[Out] -((Sqrt[Pi]*x*(FresnelC[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(
Cos[a/(2*b)] - Sin[a/(2*b)]) + FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt
[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)])))/(Sqrt[b]*(Cos[ArcSin[1 + d*x
^2]/2] - Sin[ArcSin[1 + d*x^2]/2])))
```

Maple [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(d\,x^{2}+1\right)}}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2+1))^(1/2),x)
[Out] int(1/(a+b*arcsin(d*x^2+1))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^{2}\right)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^{2}\right)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}\left(dx^{2}+1\right)}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2+1))**(1/2),x)
[Out] Integral(1/sqrt(a + b*asin(d*x**2 + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^{2}\right)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx=\int \frac{1}{\sqrt{b\arcsin\left(dx^2+1\right)+a}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="giac")
[Out] integrate(1/sqrt(b*arcsin(d*x^2 + 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(d\,x^2+1\right)}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^(1/2),x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^(1/2), x)
```

3.421 $\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 238

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{bdx\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

```
[Out] (1/b)^(3/2)*x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(c
os(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin
(d*x^2+1)))-(1/b)^(3/2)*x*FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/
Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-si
n(1/2*arcsin(d*x^2+1)))-(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1)
)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used

$= \{4906\}$

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = -\frac{\sqrt{-d^2x^4-2dx^2}}{bdx\sqrt{a+b\arcsin(dx^2+1)}} - \frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)} + \frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-3/2),x]
```

```
[Out] -(Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[1 + d*x^2]])) + ((b^(-1
))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/S
qrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[Arc
Sin[1 + d*x^2]/2]) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt
[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[Ar
cSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

Rule 4906

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{-2dx^2-d^2x^4}}{bdx\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{bdx\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-3/2),x]
```

```
[Out] -(Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[1 + d*x^2]])) + ((b^(-1
))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/S
qrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[Arc
Sin[1 + d*x^2]/2]) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt
[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[Ar
cSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

Maple [F]

$$\int \frac{1}{(a+b\arcsin(d\,x^2+1))^{\frac{3}{2}}}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2+1))^(3/2),x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2+1))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(dx^2+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2+1))**(3/2),x)
[Out] Integral((a + b*asin(d*x**2 + 1))**(-3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(d\,x^2+1))^{3/2}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^(3/2),x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^(3/2), x)
```

3.422 $\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 261

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{3bdx\,(a+b\arcsin(1+dx^2))^{3/2}}+\frac{x}{3b^2\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

```
[Out] 1/3*x*FresnelC((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-
sin(1/2*a/b))*Pi^(1/2)/b^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x
^2+1)))+1/3*x*FresnelS((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1
/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/b^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*ar
csin(d*x^2+1)))-1/3*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))^(3
/2)+1/3*x/b^2/(a+b*arcsin(d*x^2+1))^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 261, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4912, 4903}

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} + \frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} + \frac{x}{3b^2\sqrt{a+b\arcsin(dx^2+1)}} - \frac{\sqrt{-d^2x^4-2dx^2}}{3bdx\,(a+b\arcsin(dx^2+1))^{3/2}}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-5/2),x]
```

```
[Out] -1/3*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^(3/2)) + x/(
3*b^2*Sqrt[a + b*ArcSin[1 + d*x^2]]) + (Sqrt[Pi]*x*FresnelC[Sqrt[a + b*ArcS
in[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(3*b^(5/2
)*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + (Sqrt[Pi]*x*Fres
nelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[
a/(2*b)]))/(3*b^(5/2)*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
)
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{-2dx^2-d^2x^4}}{3bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}} + \frac{x}{3b^2\sqrt{a+b\arcsin\left(1+dx^2\right)}} - \frac{\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx}{3b^2}$$

$$= -\frac{\sqrt{-2dx^2-d^2x^4}}{3bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}} + \frac{x}{3b^2\sqrt{a+b\arcsin\left(1+dx^2\right)}} + \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 247, normalized size of antiderivative = 0.95

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}\,dx = \frac{x\left(\frac{b(2+dx^2)}{\sqrt{-dx^2(2+dx^2)}(a+b\arcsin(1+dx^2))^{3/2}} + \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{a+b\arc}}{\sqrt{}}\right.}{\sqrt{b}(\cos(\frac{1}{2}\arcsin(1+}\right.}{3b^2}$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-5/2),x]
```

```
[Out] (x*((b*(2 + d*x^2))/(Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^(
3/2)) + 1/Sqrt[a + b*ArcSin[1 + d*x^2]] + (Sqrt[Pi]*FresnelC[Sqrt[a + b*Arc
Sin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b]
*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + (Sqrt[Pi]*Fresnel
S[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(
2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))))/(
3*b^2)
```

Maple [F]

$$\int \frac{1}{(a+b\arcsin(d\,x^2+1))^{\frac{5}{2}}}dx$$

[In] int(1/(a+b*arcsin(d*x^2+1))^(5/2),x)

[Out] int(1/(a+b*arcsin(d*x^2+1))^(5/2),x)

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(dx^2+1))^{\frac{5}{2}}}\,dx$$

[In] integrate(1/(a+b*asin(d*x**2+1))**(5/2),x)

[Out] Integral((a + b*asin(d*x**2 + 1))**(-5/2), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imaginary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)

Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(-5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^{5/2}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^(5/2),x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^(5/2), x)
```

3.423 $\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 317

$$\begin{aligned}\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx &= -\frac{\sqrt{-2dx^2-d^2x^4}}{5bdx\,(a+b\arcsin(1+dx^2))^{5/2}} \\ &\quad+\frac{x}{15b^2\,(a+b\arcsin(1+dx^2))^{3/2}}+\frac{\sqrt{-2dx^2-d^2x^4}}{15b^3dx\sqrt{a+b\arcsin(1+dx^2)}} \\ &\quad-\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\mathrm{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} \\ &\quad+\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\mathrm{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}\end{aligned}$$

```
[Out] 1/15*x/b^2/(a+b*arcsin(d*x^2+1))^(3/2)-1/15*(1/b)^(7/2)*x*FresnelS((1/b)^(1
/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1
/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+1/15*(1/b)^(7/2)*x*
FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+si
n(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/
5*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))^(5/2)+1/15*(-d^2*x^4
-2*d*x^2)^(1/2)/b^3/d/x/(a+b*arcsin(d*x^2+1))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4912, 4906}

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \frac{\sqrt{-d^2x^4-2dx^2}}{15b^3dx\sqrt{a+b\arcsin(dx^2+1)}} + \frac{x}{15b^2(a+b\arcsin(dx^2+1))^{3/2}} - \frac{\sqrt{-d^2x^4-2dx^2}}{5bdx(a+b\arcsin(dx^2+1))^{5/2}} + \frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{7/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)} - \frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{7/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}$$

```
[In] Int[(a + b*ArcSin[1 + d*x^2])^(-7/2),x]
```

```
[Out] -1/5*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^(5/2)) + x/(
15*b^2*(a + b*ArcSin[1 + d*x^2])^(3/2)) + Sqrt[-2*d*x^2 - d^2*x^4]/(15*b^3*
d*x*Sqrt[a + b*ArcSin[1 + d*x^2]]) - ((b^(-1))^(7/2)*Sqrt[Pi]*x*FresnelS[(S
qrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/
(2*b)]))/(15*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + ((b^(
-1))^(7/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])
/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(15*(Cos[ArcSin[1 + d*x^2]/2] - S
in[ArcSin[1 + d*x^2]/2]))
```

Rule 4906

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
```

```
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{-2dx^2-d^2x^4}}{5bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}} \\
&\quad+\frac{x}{15b^2\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}-\frac{\int\frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}\,dx}{15b^2} \\
&= -\frac{\sqrt{-2dx^2-d^2x^4}}{5bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}+\frac{x}{15b^2\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}} \\
&\quad+\frac{\sqrt{-2dx^2-d^2x^4}}{15b^3dx\sqrt{a+b\arcsin\left(1+dx^2\right)}} \\
&\quad-\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} \\
&\quad+\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 297, normalized size of antiderivative = 0.94

$$
\int\frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{7/2}}\,dx=\frac{-\frac{3b\sqrt{-dx^2(2+dx^2)}}{d}+x^2\left(a+b\arcsin\left(1+dx^2\right)\right)+\frac{\sqrt{-dx^2(2+dx^2)}\left(a+b\arcsin\left(1+dx^2\right)\right)^2}{bd}}{x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}-\frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\mathrm{F}}{\mathrm{co}}
$$

```
[In] Integrate[(a + b*ArcSin[1 + d*x^2])^(-7/2),x]
```

```
[Out] (((-3*b*Sqrt[-(d*x^2*(2 + d*x^2))])/d + x^2*(a + b*ArcSin[1 + d*x^2]) + (Sq
rt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^2)/(b*d))/(x*(a + b*ArcS
in[1 + d*x^2])^(5/2)) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*S
qrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos
[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) + ((b^(-1))^(3/2)*Sqrt[Pi
]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/
(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2
]))/(15*b^2)
```

Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}+1\right)\right)^{\frac{7}{2}}}dx$$

[In] int(1/(a+b*arcsin(d*x^2+1))^(7/2),x)

[Out] int(1/(a+b*arcsin(d*x^2+1))^(7/2),x)

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{7/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)^{\frac{7}{2}}}\,dx$$

[In] integrate(1/(a+b*asin(d*x**2+1))**(7/2),x)

[Out] Integral((a + b*asin(d*x**2 + 1))**(-7/2), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{7/2}}\,dx = \text{Exception raised: RuntimeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)

Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 + 1) + a)^(-7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^{7/2}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 + 1))^(7/2),x)
[Out] int(1/(a + b*asin(d*x^2 + 1))^(7/2), x)
```

3.424 $\int (a-b\arcsin(1-dx^2))^{5/2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 299

$$\int (a-b\arcsin(1-dx^2))^{5/2}\,dx = -15b^2x\sqrt{a-b\arcsin(1-dx^2)} + \frac{5b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^{3/2}}{dx} + x(a-b\arcsin(1-dx^2))^{5/2} + \frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] x*(a+b*arcsin(d*x^2-1))^(5/2)+15*x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2-
1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(-1/b)^(5/2)/(cos(
1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-15*x*FresnelS((-1/b)^(1/2)*(
a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(
-1/b)^(5/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+5*b*(a+b*ar
csin(d*x^2-1))^(3/2)*(-d^2*x^4+2*d*x^2)^(1/2)/d/x-15*b^2*x*(a+b*arcsin(d*x^
2-1))^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4898, 4895}

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}dx=-15b^2x\sqrt{a-b\arcsin\left(1-dx^2\right)}+\frac{5b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}{dx}+\frac{15\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\operatorname{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}-\frac{15\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\operatorname{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(5/2),x]
```

```
[Out] -15*b^2*x*Sqrt[a - b*ArcSin[1 - d*x^2]] + (5*b*Sqrt[2*d*x^2 - d^2*x^4]*(a -
 b*ArcSin[1 - d*x^2])^(3/2))/(d*x) + x*(a - b*ArcSin[1 - d*x^2])^(5/2) + (1
5*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi
]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/((-b^(-1))^(5/2)*(Cos[ArcSin[1 - d*x^2]/2
] - Sin[ArcSin[1 - d*x^2]/2])) - (15*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*Sqr
t[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/((-b^(
-1))^(5/2)*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Rule 4895

```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
```

```
2, 1] && GtQ[n, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{5b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^{3/2}}{dx} \\ &\quad + x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}-\left(15b^2\right)\int\sqrt{a-b\arcsin(1-dx^2)}\,dx \\ &= -15b^2x\sqrt{a-b\arcsin(1-dx^2)} \\ &\quad + \frac{5b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^{3/2}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} \\ &\quad + \frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} \\ &\quad - \frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 292, normalized size of antiderivative = 0.98

$$\int\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx = \frac{5b\sqrt{-dx^2\left(-2+dx^2\right)}(a-b\arcsin(1-dx^2))^{3/2}}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} + \frac{15bx\left(-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\right.}{\left(-\frac{1}{b}\right)^{3/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx\right.\right.}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(5/2),x]
[Out] (5*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*(a - b*ArcSin[1 - d*x^2])^(3/2))/(d*x) + x
*(a - b*ArcSin[1 - d*x^2])^(5/2) + (15*b*x*(-(Sqrt[Pi]*FresnelC[(Sqrt[-b^(-
1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))
 + Sqrt[Pi]*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]
]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2
]]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])))/((-b^(-1))^(3/2)
*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{\frac{5}{2}}d x$$

```
[In] int((a+b*arcsin(d*x^2-1))^(5/2),x)
[Out] int((a+b*arcsin(d*x^2-1))^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \int \left(a+b\,\text{asin}\left(dx^{2}-1\right)\right)^{\frac{5}{2}}\, dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**(5/2),x)
[Out] Integral((a + b*asin(d*x**2 - 1))**(5/2), x)
```

Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \int { \left(b \arcsin \left(d x^{2} - 1\right) + a\right)}^{\frac{5}{2}}\,{d x}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(5/2), x)
```

Giac [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^{\frac{5}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^{5/2}\,dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^(5/2),x)
[Out] int((a + b*asin(d*x^2 - 1))^(5/2), x)
```

3.425 $\int (a-b\arcsin(1-dx^2))^{3/2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 267

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin(1-dx^2)}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}+\frac{3(-b)^{3/2}\sqrt{\pi}x\operatorname{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}+\frac{3(-b)^{3/2}\sqrt{\pi}x\operatorname{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}$$

```
[Out] x*(a+b*arcsin(d*x^2-1))^(3/2)+3*(-b)^(3/2)*x*FresnelS((a+b*arcsin(d*x^2-1))
^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*a
rcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+3*(-b)^(3/2)*x*FresnelC((a+b*arcs
in(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2
)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+3*b*(-d^2*x^4+2*d*x^2
)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used

= {4898, 4903}

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx = \frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx} + \frac{3\sqrt{\pi}(-b)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\operatorname{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)} + \frac{3\sqrt{\pi}(-b)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\operatorname{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(3/2),x]
```

```
[Out] (3*b*Sqrt[2*d*x^2 - d^2*x^4]*Sqrt[a - b*ArcSin[1 - d*x^2]])/(d*x) + x*(a -
b*ArcSin[1 - d*x^2])^(3/2) + (3*(-b)^(3/2)*Sqrt[Pi]*x*FresnelS[Sqrt[a - b*A
rcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[
ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + (3*(-b)^(3/2)*Sqrt[Pi]*x
*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)]
+ Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

Rule 4898

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (-Dist[4*b^2*n*(n - 1), Int[(a + b*ArcSin[
c + d*x^2])^(n - 2), x], x] + Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b
*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = \frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx} + x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2} - \left(3b^2\right)\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^2\right)}}\,dx$$

$$= \frac{3b\sqrt{2dx^2 - d^2x^4}\sqrt{a - b\arcsin(1 - dx^2)}}{dx} + x\left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} + \frac{3(-b)^{3/2}\sqrt{\pi}x \operatorname{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right) - \sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1 - dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 - dx^2)\right)} + \frac{3(-b)^{3/2}\sqrt{\pi}x \operatorname{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right) + \sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1 - dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 - dx^2)\right)}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 265, normalized size of antiderivative = 0.99

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} dx = \frac{3b\sqrt{-dx^2(-2 + dx^2)}\sqrt{a - b\arcsin(1 - dx^2)}}{dx} + x\left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} + \frac{3(-b)^{3/2}\sqrt{\pi}x \operatorname{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right) - \sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1 - dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 - dx^2)\right)} + \frac{3(-b)^{3/2}\sqrt{\pi}x \operatorname{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right) + \sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1 - dx^2)\right) - \sin\left(\frac{1}{2}\arcsin(1 - dx^2)\right)}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(3/2),x]
```

```
[Out] (3*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*Sqrt[a - b*ArcSin[1 - d*x^2]])/(d*x) + x*(
a - b*ArcSin[1 - d*x^2])^(3/2) + (3*(-b)^(3/2)*Sqrt[Pi]*x*FresnelS[Sqrt[a -
 b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(
Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + (3*(-b)^(3/2)*Sqrt[P
i]*x*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*
b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

Maple [F]

$$\int \left(a + b\arcsin\left(d\,x^2 - 1\right)\right)^{\frac{3}{2}} dx$$

```
[In] int((a+b*arcsin(d*x^2-1))^(3/2),x)
```

```
[Out] int((a+b*arcsin(d*x^2-1))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} dx = \int \left(a + b\,\mathrm{asin}\left(dx^2 - 1\right)\right)^{\frac{3}{2}} dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**(3/2),x)
```

```
[Out] Integral((a + b*asin(d*x**2 - 1))**(3/2), x)
```

Maxima [F]

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} dx = \int \left(b\arcsin\left(dx^2 - 1\right) + a\right)^{\frac{3}{2}} dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(3/2), x)
```

Giac [F]

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^{3/2} dx = \int \left(b\arcsin\left(dx^2 - 1\right) + a\right)^{\frac{3}{2}} dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^(3/2),x)
[Out] int((a + b*asin(d*x^2 - 1))^(3/2), x)
```

3.426 $\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 228

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx = x\sqrt{a-b\arcsin\left(1-dx^2\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

```
[Out] -x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b
)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1))
)/(-1/b)^(1/2)+x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2)
)*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*ar
csin(d*x^2-1)))/(-1/b)^(1/2)+x*(a+b*arcsin(d*x^2-1))^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used

$= \{4895\}$

$$\int \sqrt{a-b\arcsin(1-dx^2)}\,dx =$$

$$-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}+\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}+x\sqrt{a-b\arcsin(1-dx^2)}$$

```
[In] Int[Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

```
[Out] x*Sqrt[a - b*ArcSin[1 - d*x^2]] - (Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[
a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b
^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi]*x
*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2
*b)] + Sin[a/(2*b)]))/(Sqrt[-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin
[1 - d*x^2]/2]))
```

Rule 4895

```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = x\sqrt{a-b\arcsin(1-dx^2)}-\frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}+\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.99

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx = \frac{x\left(-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(c\right.\right.}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right.\right.}$$

```
[In] Integrate[Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

```
[Out] (x*(-(Sqrt[Pi]*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[
Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)])) + Sqrt[Pi]*FresnelS[(Sqrt[-b^(-1)]*Sqrt
[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[-
b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSi
n[1 - d*x^2]/2])))/(Sqrt[-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1
- d*x^2]/2]))
```

Maple [F]

$$\int \sqrt{a+b\arcsin\left(d\,x^2-1\right)}dx$$

```
[In] int((a+b*arcsin(d*x^2-1))^(1/2),x)
```

```
[Out] int((a+b*arcsin(d*x^2-1))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{a - b \arcsin(1 - dx^2)}\, dx = \int \sqrt{a + b \operatorname{asin}(dx^2 - 1)}\, dx$$

```
[In] integrate((a+b*asin(d*x**2-1))**(1/2),x)
[Out] Integral(sqrt(a + b*asin(d*x**2 - 1)), x)
```

Maxima [F]

$$\int \sqrt{a - b \arcsin(1 - dx^2)}\, dx = \int \sqrt{b \arcsin(dx^2 - 1) + a}\, dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

Giac [F]

$$\int \sqrt{a - b \arcsin(1 - dx^2)}\, dx = \int \sqrt{b \arcsin(dx^2 - 1) + a}\, dx$$

```
[In] integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a - b \arcsin(1 - dx^2)}\, dx = \int \sqrt{a + b \operatorname{asin}(d\,x^2 - 1)}\, dx$$

```
[In] int((a + b*asin(d*x^2 - 1))^(1/2),x)
[Out] int((a + b*asin(d*x^2 - 1))^(1/2), x)
```

3.427 $\int \frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 201

$$\int \frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}\,dx = -\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] -x*FresnelS((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-
sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))/
(-b)^(1/2)-x*FresnelC((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos
(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d
*x^2-1)))/(-b)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {4903}

$$\int \frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}\,dx = -\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[In] Int[1/Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

```
[Out] -((Sqrt[Pi]*x*FresnelS[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(
Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[Arc
Sin[1 - d*x^2]/2]))) - (Sqrt[Pi]*x*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(
Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1
- d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.77

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^2\right)}}\,dx = \frac{b\sqrt{\pi}x\left(\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\right)}{(-b)^{3/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

```
[In] Integrate[1/Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

```
[Out] (b*Sqrt[Pi]*x*(FresnelS[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*
(Cos[a/(2*b)] - Sin[a/(2*b)]) + FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqr
t[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)])))/((-b)^(3/2)*(Cos[ArcSin[1
- d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

Maple [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(d\,x^{2}-1\right)}}dx$$

[In] int(1/(a+b*arcsin(d*x^2-1))^(1/2),x)

[Out] int(1/(a+b*arcsin(d*x^2-1))^(1/2),x)

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^{2}\right)}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^{2}\right)}}\,dx = \int \frac{1}{\sqrt{a+b\,\text{asin}\left(dx^{2}-1\right)}}\,dx$$

[In] integrate(1/(a+b*asin(d*x**2-1))**(1/2),x)

[Out] Integral(1/sqrt(a + b*asin(d*x**2 - 1)), x)

Maxima [F]

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^{2}\right)}}\,dx = \int \frac{1}{\sqrt{b\arcsin\left(dx^{2}-1\right)+a}}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="maxima")

[Out] integrate(1/sqrt(b*arcsin(d*x^2 - 1) + a), x)

Giac [F]

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^2\right)}}\,dx=\int \frac{1}{\sqrt{b\arcsin\left(dx^2-1\right)+a}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="giac")
[Out] integrate(1/sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^2\right)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(d\,x^2-1\right)}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1))^(1/2),x)
[Out] int(1/(a + b*asin(d*x^2 - 1))^(1/2), x)
```

3.428 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 256

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}\,dx=-\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin\left(1-dx^2\right)}}-\frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}+\frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}$$

```
[Out] -(-1/b)^(3/2)*x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))
*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arc
sin(d*x^2-1)))+(-1/b)^(3/2)*x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(
1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1
))+sin(1/2*arcsin(d*x^2-1)))-(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x
^2-1))^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used

$= \{4906\}$

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)} + \frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-3/2),x]
```

```
[Out] -(Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a - b*ArcSin[1 - d*x^2]])) - ((-b^(-1
))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/
Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[Ar
cSin[1 - d*x^2]/2]) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*S
qrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos
[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

Rule 4906

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)} + \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)} + \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-3/2),x]
```

```
[Out] -(Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a - b*ArcSin[1 - d*x^2]])) - ((-b^(-1
))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/
Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[Ar
cSin[1 - d*x^2]/2]) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*S
qrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos
[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

Maple [F]

$$\int \frac{1}{(a+b\arcsin(d\,x^2-1))^{\frac{3}{2}}}dx$$

```
[In] int(1/(a+b*arcsin(d*x^2-1))^(3/2),x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2-1))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(dx^2-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2-1))**(3/2),x)
[Out] Integral((a + b*asin(d*x**2 - 1))**(-3/2), x)
```

Maxima [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2-1)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-3/2), x)
```

Giac [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2-1)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(d\,x^2-1))^{3/2}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1))^(3/2),x)
[Out] int(1/(a + b*asin(d*x^2 - 1))^(3/2), x)
```

3.429 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 281

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{3bdx\,(a-b\arcsin(1-dx^2))^{3/2}}+\frac{x}{3b^2\sqrt{a-b\arcsin(1-dx^2)}}+\frac{\sqrt{\pi}x\,\mathrm{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}+\frac{\sqrt{\pi}x\,\mathrm{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[Out] 1/3*x*FresnelS((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/
b)-sin(1/2*a/b))*Pi^(1/2)/(-b)^(5/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcs
in(d*x^2-1)))+1/3*x*FresnelC((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2
))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(-b)^(5/2)/(cos(1/2*arcsin(d*x^2-1)
)+sin(1/2*arcsin(d*x^2-1)))-1/3*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(
d*x^2-1))^(3/2)+1/3*x/b^2/(a+b*arcsin(d*x^2-1))^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4912, 4903}

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = \frac{x}{3b^2\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\sqrt{2dx^2-d^2x^4}}{3bdx\,(a-b\arcsin(1-dx^2))^{3/2}} + \frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} + \frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-5/2),x]
```

```
[Out] -1/3*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^(3/2)) + x/(3
*b^2*Sqrt[a - b*ArcSin[1 - d*x^2]]) + (Sqrt[Pi]*x*FresnelS[Sqrt[a - b*ArcSi
n[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(3*(-b)^(
5/2)*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi]*x*F
resnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] +
Sin[a/(2*b)]))/(3*(-b)^(5/2)*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x
^2]/2]))
```

Rule 4903

```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{2dx^2-d^2x^4}}{3bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}} \\
&\quad+\frac{x}{3b^2\sqrt{a-b\arcsin\left(1-dx^2\right)}}-\frac{\int\frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}\,dx}{3b^2} \\
&= -\frac{\sqrt{2dx^2-d^2x^4}}{3bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}+\frac{x}{3b^2\sqrt{a-b\arcsin\left(1-dx^2\right)}} \\
&\quad+\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} \\
&\quad+\frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.58 (sec) , antiderivative size = 270, normalized size of antiderivative = 0.96

$$
\int\frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}\,dx=\frac{\frac{-\frac{b\sqrt{-dx^2\left(-2+dx^2\right)}}{d}+x^2\left(a-b\arcsin\left(1-dx^2\right)\right)}{x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}+\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin\left(1-dx^2\right)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\right.}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-\right.\right.\right.}}{3b^2}
$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-5/2),x]
```

```
[Out] ((-((b*Sqrt[-(d*x^2*(-2 + d*x^2))])/d) + x^2*(a - b*ArcSin[1 - d*x^2]))/(x*
(a - b*ArcSin[1 - d*x^2])^(3/2)) + (Sqrt[Pi]*x*FresnelS[Sqrt[a - b*ArcSin[1
 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b]*(C
os[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi]*x*FresnelC
[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(
2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])))/(
3*b^2)
```

Maple [F]

$$
\int\frac{1}{\left(a+b\arcsin\left(d\,x^2-1\right)\right)^{\frac{5}{2}}}\,dx
$$

```
[In] int(1/(a+b*arcsin(d*x^2-1))^(5/2),x)
```

```
[Out] int(1/(a+b*arcsin(d*x^2-1))^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{5/2}}\,dx = \int \frac{1}{(a + b\,\text{asin}(dx^2 - 1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(d*x**2-1))**(5/2),x)
```

```
[Out] Integral((a + b*asin(d*x**2 - 1))**(-5/2), x)
```

Maxima [F]

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2 - 1) + a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-5/2), x)
```

Giac [F]

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2 - 1) + a)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{5/2}} \, dx = \int \frac{1}{(a + b\,\mathrm{asin}\,(d\,x^2 - 1))^{5/2}} \, dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1))^(5/2),x)
[Out] int(1/(a + b*asin(d*x^2 - 1))^(5/2), x)
```

3.430 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{7/2}}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 339

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{7/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{5bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}} + \frac{x}{15b^2\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}} + \frac{\sqrt{2dx^2-d^2x^4}}{15b^3dx\sqrt{a-b\arcsin\left(1-dx^2\right)}} + \frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} - \frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}$$

```
[Out] 1/15*x/b^2/(a+b*arcsin(d*x^2-1))^(3/2)+1/15*(-1/b)^(7/2)*x*FresnelC((-1/b)^
(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^
(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/15*(-1/b)^(7/2)
*x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b
)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1))
)-1/5*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2-1))^(5/2)+1/15*(-d^2
*x^4+2*d*x^2)^(1/2)/b^3/d/x/(a+b*arcsin(d*x^2-1))^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 339, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4912, 4906}

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \frac{\sqrt{2dx^2-d^2x^4}}{15b^3dx\sqrt{a-b\arcsin(1-dx^2)}} + \frac{x}{15b^2(a-b\arcsin(1-dx^2))^{3/2}} - \frac{\sqrt{2dx^2-d^2x^4}}{5bdx(a-b\arcsin(1-dx^2))^{5/2}} + \frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{7/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{7/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

```
[In] Int[(a - b*ArcSin[1 - d*x^2])^(-7/2),x]
```

```
[Out] -1/5*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^(5/2)) + x/(1
5*b^2*(a - b*ArcSin[1 - d*x^2])^(3/2)) + Sqrt[2*d*x^2 - d^2*x^4]/(15*b^3*d*
x*Sqrt[a - b*ArcSin[1 - d*x^2]]) + ((-b^(-1))^(7/2)*Sqrt[Pi]*x*FresnelC[(Sq
rt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/
(2*b)]))/(15*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) - ((-b^
(-1))^(7/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]
])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(15*(Cos[ArcSin[1 - d*x^2]/2] -
 Sin[ArcSin[1 - d*x^2]/2]))
```

Rule 4906

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

Rule 4912

```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (-Dist[1/(
4*b^2*(n + 1)*(n + 2)), Int[(a + b*ArcSin[c + d*x^2])^(n + 2), x], x] + Sim
p[Sqrt[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n +
```

```
 1)*x)), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{2dx^2-d^2x^4}}{5bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}} \\
&\quad+\frac{x}{15b^2\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}-\frac{\int\frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}\,dx}{15b^2} \\
&= -\frac{\sqrt{2dx^2-d^2x^4}}{5bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}+\frac{x}{15b^2\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}} \\
&\quad+\frac{\sqrt{2dx^2-d^2x^4}}{15b^3dx\sqrt{a-b\arcsin\left(1-dx^2\right)}} \\
&\quad+\frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} \\
&\quad-\frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 319, normalized size of antiderivative = 0.94

$$\int\frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{7/2}}\,dx=\frac{\frac{-\frac{3b\sqrt{dx^2\left(2-dx^2\right)}}{d}+x^2\left(a-b\arcsin\left(1-dx^2\right)\right)+\frac{\sqrt{dx^2\left(2-dx^2\right)}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{bd}}{x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}+\frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{Fr}}{\text{cos}}}{}$$

```
[In] Integrate[(a - b*ArcSin[1 - d*x^2])^(-7/2),x]
```

```
[Out] (((-3*b*Sqrt[d*x^2*(2 - d*x^2)])/d + x^2*(a - b*ArcSin[1 - d*x^2]) + (Sqrt[
d*x^2*(2 - d*x^2)]*(a - b*ArcSin[1 - d*x^2])^2)/(b*d))/(x*(a - b*ArcSin[1 -
 d*x^2])^(5/2)) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[
a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[Arc
Sin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + ((-b^(-1))^(5/2)*b*Sqrt[Pi]
*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/
(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2
]))/(15*b^2)
```

Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}-1\right)\right)^{\frac{7}{2}}}dx$$

[In] int(1/(a+b*arcsin(d*x^2-1))^(7/2),x)

[Out] int(1/(a+b*arcsin(d*x^2-1))^(7/2),x)

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^{2}-1\right)\right)^{\frac{7}{2}}}\,dx$$

[In] integrate(1/(a+b*asin(d*x**2-1))**(7/2),x)

[Out] Integral((a + b*asin(d*x**2 - 1))**(-7/2), x)

Maxima [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^{2}-1\right)+a\right)^{\frac{7}{2}}}\,dx$$

[In] integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="maxima")

[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-7/2), x)

Giac [F]

$$\int \frac{1}{\left(a - b\arcsin\left(1 - dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2 - 1\right) + a\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="giac")
[Out] integrate((b*arcsin(d*x^2 - 1) + a)^(-7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\left(a - b\arcsin\left(1 - dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(a + b\,\mathrm{asin}\left(d\,x^2 - 1\right)\right)^{7/2}}\,dx$$

```
[In] int(1/(a + b*asin(d*x^2 - 1))^(7/2),x)
[Out] int(1/(a + b*asin(d*x^2 - 1))^(7/2), x)
```

3.431 $\int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2} \, dx$

Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2} \, dx = \text{Int}\left(\frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2} \, dx = \int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2} \, dx$$

```
[In] Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
[Out] Defer[Int][(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2} \, dx$$

Mathematica [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$$

```
[In] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
[Out] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.12 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)^n}{-c^2x^2+1}dx$$

```
[In] int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
[Out] int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

Fricas [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="fricas")
[Out] integral(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**n/(-c**2*x**2+1),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 1.08 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx = \int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="maxima")
[Out] -integrate((b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

Giac [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx = \int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="giac")
[Out] integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

Mupad [N/A]

Not integrable

Time = 0.71 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=-\int \frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^n}{c^2\,x^2-1}\,dx$$

```
[In] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^n/(c^2*x^2 - 1),x)
[Out] -int((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^n/(c^2*x^2 - 1), x)
```

3.432 $\int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2} \, dx$

Optimal result

Integrand size = 40, antiderivative size = 275

$$\int \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2} \, dx = \frac{i\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} - \frac{\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3 \log\left(1-e^{2i \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{3ib\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2 \operatorname{PolyLog}\left(2, e^{2i \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{3b^2\left(a+b \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right) \operatorname{PolyLog}\left(3, e^{2i \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{3ib^3 \operatorname{PolyLog}\left(4, e^{2i \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{4c}$$

```
[Out] 1/4*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^4/b/c-(a+b*arcsin((-c*x+1)
^(1/2)/(c*x+1)^(1/2)))^3*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(
c*x+1))^(1/2))^2)/c+3/2*I*b*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2*po
lylog(2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c-3/
2*b^2*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))*polylog(3,(I*(-c*x+1)^(1/2
)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c-3/4*I*b^3*polylog(4,(I*(-c
*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {6813, 4721, 3798, 2221, 2611, 6744, 2320, 6724}

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = -\frac{3b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{2c} + \frac{3ib\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{2c} + \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^4}{4bc} - \frac{\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{c} - \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)}{4c}$$

```
[In] Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
```

```
[Out] ((I/4)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^4)/(b*c) - ((a + b*ArcSi
n[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3*Log[1 - E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqr
t[1 + c*x]])])/c + (((3*I)/2)*b*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])
^2*PolyLog[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/c - (3*b^2*(a
 + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog[3, E^((2*I)*ArcSin[Sqrt[1
 - c*x]/Sqrt[1 + c*x]])])/(2*c) - (((3*I)/4)*b^3*PolyLog[4, E^((2*I)*ArcSin
[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/c
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 6813

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^3}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c}$$

$$= -\frac{\text{Subst}\left(\int (a+bx)^3\cot(x)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} + \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^3}{1-e^{2ix}}\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{(3b)\text{Subst}\left(\int (a+bx)^2\log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{3ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{PolyLog}\left(2, e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{(3ib^2)\,\text{Subst}\left(\int (a+bx)\,\text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{3ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{PolyLog}\left(2, e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{3b^2\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{PolyLog}\left(3, e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} + \frac{(3b^3)\,\text{Subst}\left(\int \text{PolyLog}\left(3, e^{2ix}\right)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{2c}$$

$$=\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc}-\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c}+\frac{3ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}-\frac{3b^2\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}-\frac{(3ib^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(3,x)}{x}\,dx,x,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{4c}$$

$$=\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc}-\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c}+\frac{3ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}-\frac{3b^2\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}-\frac{3ib^3\,\text{PolyLog}\left(4,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{4c}$$

Mathematica [F]

$$\int\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$$

```
[In] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
[Out] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2), x]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1170 vs. 2(300) = 600.

Time = 3.27 (sec) , antiderivative size = 1171, normalized size of antiderivative = 4.26

method	result	size
default	Expression too large to display	1171
parts	Expression too large to display	1171

```
[In] int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x,method=_RET
URNVERBOSE)
```

```
[Out] -1/2*a^3/c*ln(c*x-1)+1/2*a^3/c*ln(c*x+1)-b^3*(-1/4*I/c*arcsin((-c*x+1)^(1/2
)/(c*x+1)^(1/2))^4+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3*ln(I*(-c*x+1)
^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-3*I/c*arcsin((-c*x+1)^(1
/2)/(c*x+1)^(1/2))^2*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/
(c*x+1))^(1/2))+6/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,-I*(-c*x
+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+6*I/c*polylog(4,-I*(-c*
x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1
/2)/(c*x+1)^(1/2))^3*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1
))^(1/2))-3*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*polylog(2,I*(-c*x+1)
^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))+6/c*arcsin((-c*x+1)^(1/2)/
(c*x+1)^(1/2))*polylog(3,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1)
)^(1/2))+6*I/c*polylog(4,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1)
)^(1/2)))-3*a*b^2*(-1/3*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3+1/c*arcs
in((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c
*x+1)/(c*x+1))^(1/2)+1)-2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(
2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+2/c*polylog(3
,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c
*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1
)/(c*x+1))^(1/2))-2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2,I*(-
c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))+2/c*polylog(3,I*(-c*
x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)))-3*a^2*b*(-1/2*I/c*arc
sin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)
)*ln(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-I/c*polyl
og(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin
((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x
+1)/(c*x+1))^(1/2))-I/c*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1
)/(c*x+1))^(1/2)))
```

Fricas [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="fricas")
```

```
[Out] integral(-(b^3*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1))^3 + 3*a*b^2*arcsin(sqrt
(-c*x + 1)/sqrt(c*x + 1))^2 + 3*a^2*b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1))
+ a^3)/(c^2*x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**3/(-c**2*x**2+1),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="maxima")
```

```
[Out] 1/2*a^3*(log(c*x + 1)/c - log(c*x - 1)/c) - integrate((b^3*arctan2(sqrt(-c*
x + 1), sqrt(2)*sqrt(c)*sqrt(x))^3 + 3*a*b^2*arctan2(sqrt(-c*x + 1), sqrt(2
)*sqrt(c)*sqrt(x))^2 + 3*a^2*b*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt
(x)))/(c^2*x^2 - 1), x)
```

Giac [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="giac")
[Out] integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^3/(c^2*x^2 - 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^3}{c^2\,x^2-1}\,dx$$

```
[In] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^3/(c^2*x^2 - 1),x)
[Out] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^3/(c^2*x^2 - 1), x)
```

3.433 $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$

Optimal result

Integrand size = 40, antiderivative size = 205

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} - \frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

```
[Out] 1/3*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/b/c-(a+b*arcsin((-c*x+1)
^(1/2)/(c*x+1)^(1/2)))^2*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(
c*x+1))^(1/2))^2)/c+I*b*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))*polylog(
2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c-1/2*b^2*
polylog(3,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {6813, 4721, 3798, 2221, 2611, 2320, 6724}

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c} + \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{3bc} - \frac{\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{c} - \frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)}{2c}$$

```
[In] Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
```

```
[Out] ((I/3)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3)/(b*c) - ((a + b*ArcSi
n[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*Log[1 - E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqr
t[1 + c*x]])])/c + (I*b*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog
[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/c - (b^2*PolyLog[3, E^(
(2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/(2*c)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6813

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\text{Subst}\left(\int \frac{(a+b\arcsin(x))^2}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c} \\
&= -\frac{\text{Subst}\left(\int (a+bx)^2\cot(x)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} + \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} \\
&\quad + \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}
\end{aligned}
$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} - \frac{(ib^2)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} - \frac{b^2\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

$$= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} - \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

Mathematica [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$$

```
[In] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
[Out] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2), x]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 656 vs. 2(226) = 452.

Time = 1.30 (sec) , antiderivative size = 657, normalized size of antiderivative = 3.20

method	result
default	$-\frac{a^2\ln(cx-1)}{2c}+\frac{a^2\ln(cx+1)}{2c}-b^2\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3}{3c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{2i\arcsin}{}\right.$
parts	$-\frac{a^2\ln(cx-1)}{2c}+\frac{a^2\ln(cx+1)}{2c}-b^2\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3}{3c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{2i\arcsin}{}\right.$

```
[In] int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x,method=_RET
URNVERBOSE)
```

```
[Out] -1/2*a^2/c*ln(c*x-1)+1/2*a^2/c*ln(c*x+1)-b^2*(-1/3*I/c*arcsin((-c*x+1)^(1/2
)/(c*x+1)^(1/2))^3+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(I*(-c*x+1)
^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-2*I/c*arcsin((-c*x+1)^(1
/2)/(c*x+1)^(1/2))*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c
*x+1))^(1/2))+2/c*polylog(3,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*
x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(1-I*(-c*x+1)^(1/
2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-2*I/c*arcsin((-c*x+1)^(1/2)/(c
*x+1)^(1/2))*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^
(1/2))+2/c*polylog(3,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1
/2)))-2*a*b*(-1/2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2+1/c*arcsin((-c
*x+1)^(1/2)/(c*x+1)^(1/2))*ln(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c
*x+1))^(1/2)+1)-I/c*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(
c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1-I*(-c*x+1)^(1/
2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-I/c*polylog(2,I*(-c*x+1)^(1/2)
/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)))
```

Fricas [F]

$$\int\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int-\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1))^2 + 2*a*b*arcsin(sqrt(-
c*x + 1)/sqrt(c*x + 1)) + a^2)/(c^2*x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2/(-c**2*x**2+1),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="maxima")
[Out] 1/2*a^2*(log(c*x + 1)/c - log(c*x - 1)/c) - integrate((b^2*arctan2(sqrt(-c*
x + 1), sqrt(2)*sqrt(c)*sqrt(x))^2 + 2*a*b*arctan2(sqrt(-c*x + 1), sqrt(2)*
sqrt(c)*sqrt(x)))/(c^2*x^2 - 1), x)
```

Giac [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="giac")
[Out] integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2/(c^2*x^2 - 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^2}{c^2\,x^2-1}\,dx$$

```
[In] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2/(c^2*x^2 - 1),x)
[Out] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2/(c^2*x^2 - 1), x)
```

3.434 $\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$

Optimal result

Integrand size = 38, antiderivative size = 141

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

```
[Out] 1/2*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/b/c-(a+b*arcsin((-c*x+1)
^(1/2)/(c*x+1)^(1/2)))*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*
x+1))^(1/2))^2)/c+1/2*I*b*polylog(2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*
x+1)/(c*x+1))^(1/2))^2)/c
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$, Rules used

$= \{212, 6813, 4721, 3798, 2221, 2317, 2438\}$

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{2bc} - \frac{\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c} + \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)}{2c}$$

```
[In] Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
```

```
[Out] ((I/2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2)/(b*c) - ((a + b*ArcSi
n[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*Log[1 - E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[
1 + c*x]])])/c + ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 +
 c*x]])])/c
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 6813

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\text{Subst}\left(\int \frac{a+b\arcsin(x)}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c} \\
&= -\frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} + \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} \\
&\quad + \frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}{c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} \\
&\quad - \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} \\
&= \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} \\
&\quad + \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}
\end{aligned}
$$

Mathematica [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx=\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$$

```
[In] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
[Out] Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2), x]
```

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.94

method	result
default	$-\frac{a\ln(cx-1)}{2c}+\frac{a\ln(cx+1)}{2c}-b\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2}{2c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{i\,\mathrm{polylog}\left(2,-\frac{i}{}\right.}{}\right.$
parts	$-\frac{a\ln(cx-1)}{2c}+\frac{a\ln(cx+1)}{2c}-b\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2}{2c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{i\,\mathrm{polylog}\left(2,-\frac{i}{}\right.}{}\right.$

```
[In] int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x,method=_RETUR
NVERBOSE)
[Out] -1/2*a/c*ln(c*x-1)+1/2*a/c*ln(c*x+1)-b*(-1/2*I/c*arcsin((-c*x+1)^(1/2)/(c*x
+1)^(1/2))^2+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(I*(-c*x+1)^(1/2)/(
c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-I/c*polylog(2,-I*(-c*x+1)^(1/2)/
(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)
^(1/2))*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-I/c
*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx=\int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="fricas")
[Out] integral(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))/(-c**2*x**2+1),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="maxima")
```

```
[Out] 1/2*a*(log(c*x + 1)/c - log(c*x - 1)/c) - b*integrate(arctan2(sqrt(-c*x + 1
), sqrt(2)*sqrt(c)*sqrt(x))/(c^2*x^2 - 1), x)
```

Giac [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

```
[In] integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="giac")
```

```
[Out] integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \int -\frac{a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)}{c^2\,x^2-1}\,dx$$

```
[In] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))/(c^2*x^2 - 1),x)
```

```
[Out] int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))/(c^2*x^2 - 1), x)
```

3.435 $\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$

Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = \text{Int}\left(\frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = \int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])), x
]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
[Out] Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.90 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{1}{(-c^2x^2+1)\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)}dx$$

```
[In] int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
[Out] int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.20

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="fricas")
[Out] integral(-1/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1
)) - a), x)
```

Sympy [N/A]

Not integrable

Time = 133.39 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.52

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = -\int \frac{1}{ac^2x^2-a+bc^2x^2\operatorname{asin}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)-b\operatorname{asin}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}\,dx$$

```
[In] integrate(1/(-c**2*x**2+1)/(a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2))),x)
[Out] -Integral(1/(a*c**2*x**2 - a + b*c**2*x**2*asin(sqrt(-c*x + 1)/sqrt(c*x + 1
)) - b*asin(sqrt(-c*x + 1)/sqrt(c*x + 1))), x)
```

Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="maxima")
[Out] -integrate(1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
x)
```

Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="giac")
[Out] integrate(-1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
x)
```

Mupad [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=-\int \frac{1}{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)\,\left(c^2\,x^2-1\right)}\,dx$$

```
[In] int(-1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))*(c^2*x^2 - 1)),x)
[Out] -int(1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))*(c^2*x^2 - 1)), x)
```

3.436 $\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$

Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\text{Int}\left(\frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
 x]
```

Rubi steps

$$\text{integral}=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.16 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),x
]
```

```
[Out] Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.81 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{1}{(-c^2x^2+1)\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)^2}dx$$

```
[In] int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 2.28

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="fricas")
```

```
[Out] integral(-1/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(sqrt(-c*x + 1)/sqrt(c
*x + 1))^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1
))), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/(-c**2*x**2+1)/(a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 1.89 (sec) , antiderivative size = 225, normalized size of antiderivative = 5.62

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="maxima")
[Out] -((sqrt(2)*a*b*c^2*x - sqrt(2)*a*b*c + (sqrt(2)*b^2*c^2*x - sqrt(2)*b^2*c)*
arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(x)))*sqrt(c)*integrate(1/2*sqr
t(-c*x + 1)*sqrt(x)/(a*b*c^3*x^3 - 2*a*b*c^2*x^2 + a*b*c*x + (b^2*c^3*x^3 -
 2*b^2*c^2*x^2 + b^2*c*x)*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(x)))
, x) + sqrt(2)*sqrt(-c*x + 1)*sqrt(c)*sqrt(x))/(a*b*c^2*x - a*b*c + (b^2*c^
2*x - b^2*c)*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(x)))
```

Giac [N/A]

Not integrable

Time = 0.54 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="giac")
[Out] integrate(-1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2)
, x)
```

Mupad [N/A]

Not integrable

Time = 1.29 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = -\int \frac{1}{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^2\,(c^2\,x^2-1)}\,dx$$

```
[In] int(-1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2*(c^2*x^2 - 1)),x)
[Out] -int(1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2*(c^2*x^2 - 1)), x)
```

3.437 $\int e^x \arcsin(e^x)\, dx$

Optimal result

Integrand size = 8, antiderivative size = 22

$$\int e^x \arcsin(e^x)\, dx = \sqrt{1-e^{2x}} + e^x \arcsin(e^x)$$

```
[Out] exp(x)*arcsin(exp(x))+(1-exp(2*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {2225, 4928, 2278, 32}

$$\int e^x \arcsin(e^x)\, dx = e^x \arcsin(e^x) + \sqrt{1-e^{2x}}$$

```
[In] Int[E^x*ArcSin[E^x],x]
```

```
[Out] Sqrt[1 - E^(2*x)] + E^x*ArcSin[E^x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 4928

```
Int[((a_.) + ArcSin[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcSin[u], w, x] - Dist[b, Int[SimplifyIntegrand[w*(D[u, x]/Sqr
t[1 - u^2]), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x]
&& InverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; Fre
eQ[{c, d, m}, x]]
```

Rubi steps

$$\begin{aligned} \text{integral} &= e^x \arcsin\left(e^x\right) - \int \frac{e^{2x}}{\sqrt{1-e^{2x}}}\,dx \\ &= e^x \arcsin\left(e^x\right) - \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x}}\,dx, x, e^{2x}\right) \\ &= \sqrt{1-e^{2x}} + e^x \arcsin\left(e^x\right) \end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int e^x \arcsin\left(e^x\right)\,dx = \sqrt{1-e^{2x}} + e^x \arcsin\left(e^x\right)$$

```
[In] Integrate[E^x*ArcSin[E^x],x]
[Out] Sqrt[1 - E^(2*x)] + E^x*ArcSin[E^x]
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 18, normalized size of antiderivative = 0.82

method	result	size
derivativedivides	$\mathrm{e}^x \arcsin\left(\mathrm{e}^x\right) + \sqrt{1-\mathrm{e}^{2x}}$	18
default	$\mathrm{e}^x \arcsin\left(\mathrm{e}^x\right) + \sqrt{1-\mathrm{e}^{2x}}$	18

```
[In] int(exp(x)*arcsin(exp(x)),x,method=_RETURNVERBOSE)
[Out] exp(x)*arcsin(exp(x))+(-exp(x)^2+1)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \arcsin(e^x)\,e^x + \sqrt{-e^{(2x)} + 1}$$

```
[In] integrate(exp(x)*arcsin(exp(x)),x, algorithm="fricas")
[Out] arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \sqrt{1 - e^{2x}} + e^x \operatorname{asin}(e^x)$$

```
[In] integrate(exp(x)*asin(exp(x)),x)
[Out] sqrt(1 - exp(2*x)) + exp(x)*asin(exp(x))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \arcsin(e^x)\,e^x + \sqrt{-e^{(2x)} + 1}$$

```
[In] integrate(exp(x)*arcsin(exp(x)),x, algorithm="maxima")
[Out] arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \arcsin(e^x)\,e^x + \sqrt{-e^{(2x)} + 1}$$

```
[In] integrate(exp(x)*arcsin(exp(x)),x, algorithm="giac")
[Out] arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin \left(e^x\right) \, dx = \sqrt{1-\mathrm{e}^{2\,x}}+\mathrm{asin}(\mathrm{e}^x)\,\,\mathrm{e}^x$$

```
[In] int(asin(exp(x))*exp(x),x)
[Out] (1 - exp(2*x))^(1/2) + asin(exp(x))*exp(x)
```

3.438 $\int \arcsin \left(ce^{a+bx}\right) \, dx$

Optimal result

Integrand size = 10, antiderivative size = 84

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = -\frac{i \arcsin \left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin \left(ce^{a+bx}\right) \log \left(1-e^{2i \arcsin \left(ce^{a+bx}\right)}\right)}{b} - \frac{i \operatorname{PolyLog}\left(2, e^{2i \arcsin \left(ce^{a+bx}\right)}\right)}{2b}$$

```
[Out] -1/2*I*arcsin(c*exp(b*x+a))^2/b+arcsin(c*exp(b*x+a))*ln(1-(I*c*exp(b*x+a)+(
1-c^2*exp(b*x+a)^2)^(1/2))^2)/b-1/2*I*polylog(2,(I*c*exp(b*x+a)+(1-c^2*exp(
b*x+a)^2)^(1/2))^2)/b
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.600$, Rules used = {2320, 4721, 3798, 2221, 2317, 2438}

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = -\frac{i \operatorname{PolyLog}\left(2, e^{2i \arcsin \left(ce^{a+bx}\right)}\right)}{2b} - \frac{i \arcsin \left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin \left(ce^{a+bx}\right) \log \left(1-e^{2i \arcsin \left(ce^{a+bx}\right)}\right)}{b}$$

```
[In] Int[ArcSin[c*E^(a + b*x)],x]
```

```
[Out] ((-1/2*I)*ArcSin[c*E^(a + b*x)]^2)/b + (ArcSin[c*E^(a + b*x)]*Log[1 - E^((2
*I)*ArcSin[c*E^(a + b*x)])])/b - ((I/2)*PolyLog[2, E^((2*I)*ArcSin[c*E^(a +
 b*x)])])/b
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\arcsin(cx)}{x}\,dx, x, e^{a+bx}\right)}{b}$$

$$= \frac{\text{Subst}\left(\int x\cot(x)\,dx, x, \arcsin\left(ce^{a+bx}\right)\right)}{b}$$

$$= -\frac{i\arcsin\left(ce^{a+bx}\right)^2}{2b} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin\left(ce^{a+bx}\right)\right)}{b}$$

$$= -\frac{i\arcsin\left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{b} - \frac{\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin\left(ce^{a+bx}\right)\right)}{b}$$

$$= -\frac{i\arcsin\left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{b} + \frac{i\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{2b}$$

$$= -\frac{i\arcsin\left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{b} - \frac{i\,\text{PolyLog}\left(2, e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{2b}$$

Mathematica [F]

$$\int \arcsin\left(ce^{a+bx}\right)\,dx = \int \arcsin\left(ce^{a+bx}\right)\,dx$$

```
[In] Integrate[ArcSin[c*E^(a + b*x)],x]
[Out] Integrate[ArcSin[c*E^(a + b*x)], x]
```

Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 170, normalized size of antiderivative = 2.02

method	result
derivativedivides	$\frac{-\frac{i\arcsin\left(c\,\mathrm{e}^{bx+a}\right)^2}{2}+\arcsin\left(c\,\mathrm{e}^{bx+a}\right)\ln\left(1+ic\,\mathrm{e}^{bx+a}+\sqrt{1-c^2\mathrm{e}^{2bx+2a}}\right)-i\,\mathrm{polylog}\left(2,-ic\,\mathrm{e}^{bx+a}-\sqrt{1-c^2\mathrm{e}^{2bx+2a}}\right)+\arcsin}{b}$
default	$\frac{-\frac{i\arcsin\left(c\,\mathrm{e}^{bx+a}\right)^2}{2}+\arcsin\left(c\,\mathrm{e}^{bx+a}\right)\ln\left(1+ic\,\mathrm{e}^{bx+a}+\sqrt{1-c^2\mathrm{e}^{2bx+2a}}\right)-i\,\mathrm{polylog}\left(2,-ic\,\mathrm{e}^{bx+a}-\sqrt{1-c^2\mathrm{e}^{2bx+2a}}\right)+\arcsin}{b}$

```
[In] int(arcsin(c*exp(b*x+a)),x,method=_RETURNVERBOSE)
[Out] 1/b*(-1/2*I*arcsin(c*exp(b*x+a))^2+arcsin(c*exp(b*x+a))*ln(1+I*c*exp(b*x+a)
+(1-c^2*exp(b*x+a)^2)^(1/2))-I*polylog(2,-I*c*exp(b*x+a)-(1-c^2*exp(b*x+a)^
2)^(1/2))+arcsin(c*exp(b*x+a))*ln(1-I*c*exp(b*x+a)-(1-c^2*exp(b*x+a)^2)^(1/
2))-I*polylog(2,I*c*exp(b*x+a)+(1-c^2*exp(b*x+a)^2)^(1/2)))
```

Fricas [F(-2)]

Exception generated.

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(c*exp(b*x+a)),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \operatorname{asin}\left(ce^{a+bx}\right) dx$$

```
[In] integrate(asin(c*exp(b*x+a)),x)
```

```
[Out] Integral(asin(c*exp(a + b*x)), x)
```

Maxima [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \arcsin \left(ce^{(bx+a)}\right) \, dx$$

```
[In] integrate(arcsin(c*exp(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*(-2*I*b^2*c^2*integrate(x*e^(2*b*x + 2*a)/(c^4*e^(4*b*x + 4*a) - c^2*e^
(2*b*x + 2*a) + (c^2*e^(2*b*x + 2*a) - 1)*e^(log(c*e^(b*x + a) + 1) + log(-
c*e^(b*x + a) + 1))), x) + 2*b^2*c*integrate(x*e^(b*x + a + 1/2*log(c*e^(b*
x + a) + 1) + 1/2*log(-c*e^(b*x + a) + 1))/(c^4*e^(4*b*x + 4*a) - c^2*e^(2*
b*x + 2*a) + (c^2*e^(2*b*x + 2*a) - 1)*e^(log(c*e^(b*x + a) + 1) + log(-c*e
^(b*x + a) + 1))), x) + 2*b*x*arctan2(c*e^(b*x + a), sqrt(c*e^(b*x + a) + 1
)*sqrt(-c*e^(b*x + a) + 1)) + I*b*x*log(c*e^(b*x + a) + 1) + I*b*x*log(-c*e
^(b*x + a) + 1) + I*dilog(c*e^(b*x + a)) + I*dilog(-c*e^(b*x + a)))/b
```

Giac [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \arcsin \left(ce^{(bx+a)}\right) \, dx$$

```
[In] integrate(arcsin(c*exp(b*x+a)),x, algorithm="giac")
[Out] integrate(arcsin(c*e^(b*x + a)), x)
```

Mupad [B] (verification not implemented)

Time = 0.79 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.83

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = -\frac{\mathrm{asin}\left(c\,\mathrm{e}^{a+b\,x}\right)^2\,1{}\mathrm{i}}{2\,b}-\frac{\mathrm{polylog}\left(2,\mathrm{e}^{\mathrm{asin}\left(c\,\mathrm{e}^{a+b\,x}\right)\,2{}\mathrm{i}}\right)\,1{}\mathrm{i}}{2\,b}+\frac{\ln\left(1-\mathrm{e}^{\mathrm{asin}\left(c\,\mathrm{e}^{a+b\,x}\right)\,2{}\mathrm{i}}\right)\,\mathrm{asin}\left(c\,\mathrm{e}^{a+b\,x}\right)}{b}$$

```
[In] int(asin(c*exp(a + b*x)),x)
[Out] (log(1 - exp(asin(c*exp(a + b*x))*2i))*asin(c*exp(a + b*x)))/b - (polylog(2
, exp(asin(c*exp(a + b*x))*2i))*1i)/(2*b) - (asin(c*exp(a + b*x))^2*1i)/(2*
b)
```

3.439 $\int e^{\arcsin(ax)}x^3\,dx$

Optimal result

Integrand size = 10, antiderivative size = 81

$$\int e^{\arcsin(ax)}x^3\,dx=-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{10a^4}+\frac{e^{\arcsin(ax)}\cos(4\arcsin(ax))}{34a^4}+\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{20a^4}-\frac{e^{\arcsin(ax)}\sin(4\arcsin(ax))}{136a^4}$$

```
[Out] -1/10*exp(arcsin(a*x))*cos(2*arcsin(a*x))/a^4+1/34*exp(arcsin(a*x))*cos(4*a
rcsin(a*x))/a^4+1/20*exp(arcsin(a*x))*sin(2*arcsin(a*x))/a^4-1/136*exp(arcs
in(a*x))*sin(4*arcsin(a*x))/a^4
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4920, 12, 4557, 4517}

$$\int e^{\arcsin(ax)}x^3\,dx=\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{20a^4}-\frac{e^{\arcsin(ax)}\sin(4\arcsin(ax))}{136a^4}-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{10a^4}+\frac{e^{\arcsin(ax)}\cos(4\arcsin(ax))}{34a^4}$$

```
[In] Int[E^ArcSin[a*x]*x^3,x]
```

```
[Out] -1/10*(E^ArcSin[a*x]*Cos[2*ArcSin[a*x]])/a^4 + (E^ArcSin[a*x]*Cos[4*ArcSin[
a*x]])/(34*a^4) + (E^ArcSin[a*x]*Sin[2*ArcSin[a*x]])/(20*a^4) - (E^ArcSin[a
*x]*Sin[4*ArcSin[a*x]])/(136*a^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)\sin^3(x)}{a^3}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sin^3(x)\,dx, x, \arcsin(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{4}e^x\sin(2x)-\frac{1}{8}e^x\sin(4x)\right)\,dx, x, \arcsin(ax)\right)}{a^4}\\
&= -\frac{\text{Subst}\left(\int e^x\sin(4x)\,dx, x, \arcsin(ax)\right)}{8a^4}+\frac{\text{Subst}\left(\int e^x\sin(2x)\,dx, x, \arcsin(ax)\right)}{4a^4}\\
&= -\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{10a^4}+\frac{e^{\arcsin(ax)}\cos(4\arcsin(ax))}{34a^4}\\
&\quad+\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{20a^4}-\frac{e^{\arcsin(ax)}\sin(4\arcsin(ax))}{136a^4}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.62

$$\int e^{\arcsin(ax)}x^3\,dx = \frac{e^{\arcsin(ax)}(-68\cos(2\arcsin(ax))+20\cos(4\arcsin(ax))+34\sin(2\arcsin(ax))-5\sin(4\arcsin(ax)))}{680a^4}$$

```
[In] Integrate[E^ArcSin[a*x]*x^3,x]
[Out] (E^ArcSin[a*x]*(-68*Cos[2*ArcSin[a*x]] + 20*Cos[4*ArcSin[a*x]] + 34*Sin[2*A
rcSin[a*x]] - 5*Sin[4*ArcSin[a*x]]))/(680*a^4)
```

Maple [F]

$$\int e^{\arcsin(ax)}x^3dx$$

```
[In] int(exp(arcsin(a*x))*x^3,x)
[Out] int(exp(arcsin(a*x))*x^3,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.67

$$\int e^{\arcsin(ax)}x^3\,dx = \frac{\left(20\,a^4x^4-3\,a^2x^2+\left(5\,a^3x^3+6\,ax\right)\sqrt{-a^2x^2+1}-6\right)e^{(\arcsin(ax))}}{85\,a^4}$$

```
[In] integrate(exp(arcsin(a*x))*x^3,x, algorithm="fricas")
[Out] 1/85*(20*a^4*x^4 - 3*a^2*x^2 + (5*a^3*x^3 + 6*a*x)*sqrt(-a^2*x^2 + 1) - 6)*
e^(arcsin(a*x))/a^4
```

Sympy [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.23

$$\int e^{\arcsin(ax)}x^3\,dx = \begin{cases} \frac{4x^4e^{\operatorname{asin}(ax)}}{17}+\frac{x^3\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{17a}-\frac{3x^2e^{\operatorname{asin}(ax)}}{85a^2}+\frac{6x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{85a^3}-\frac{6e^{\operatorname{asin}(ax)}}{85a^4} & \text{for } a \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x))*x**3,x)
```

```
[Out] Piecewise((4*x**4*exp(asin(a*x))/17 + x**3*sqrt(-a**2*x**2 + 1)*exp(asin(a*
x))/(17*a) - 3*x**2*exp(asin(a*x))/(85*a**2) + 6*x*sqrt(-a**2*x**2 + 1)*exp
(asin(a*x))/(85*a**3) - 6*exp(asin(a*x))/(85*a**4), Ne(a, 0)), (x**4/4, Tru
e))
```

Maxima [F]

$$\int e^{\arcsin(ax)}x^3\,dx = \int x^3e^{(\arcsin(ax))}\,dx$$

```
[In] integrate(exp(arcsin(a*x))*x^3,x, algorithm="maxima")
```

```
[Out] integrate(x^3*e^(arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.20

$$\int e^{\arcsin(ax)}x^3\,dx = -\frac{(-a^2x^2+1)^{\frac{3}{2}}xe^{(\arcsin(ax))}}{17\,a^3} + \frac{11\,\sqrt{-a^2x^2+1}xe^{(\arcsin(ax))}}{85\,a^3} + \frac{4\,(a^2x^2-1)^2e^{(\arcsin(ax))}}{17\,a^4} + \frac{37\,(a^2x^2-1)e^{(\arcsin(ax))}}{85\,a^4} + \frac{11\,e^{(\arcsin(ax))}}{85\,a^4}$$

```
[In] integrate(exp(arcsin(a*x))*x^3,x, algorithm="giac")
```

```
[Out] -1/17*(-a^2*x^2 + 1)^(3/2)*x*e^(arcsin(a*x))/a^3 + 11/85*sqrt(-a^2*x^2 + 1)
*x*e^(arcsin(a*x))/a^3 + 4/17*(a^2*x^2 - 1)^2*e^(arcsin(a*x))/a^4 + 37/85*(
a^2*x^2 - 1)*e^(arcsin(a*x))/a^4 + 11/85*e^(arcsin(a*x))/a^4
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x^3\,dx = \int x^3\,\mathrm{e}^{\mathrm{asin}(a\,x)}\,dx$$

```
[In] int(x^3*exp(asin(a*x)),x)
```

```
[Out] int(x^3*exp(asin(a*x)), x)
```

3.440 $\int e^{\arcsin(ax)}x^2\,dx$

Optimal result

Integrand size = 10, antiderivative size = 82

$$\int e^{\arcsin(ax)}x^2\,dx=\frac{e^{\arcsin(ax)}x}{8a^2}+\frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{8a^3}-\frac{e^{\arcsin(ax)}\cos(3\arcsin(ax))}{40a^3}-\frac{3e^{\arcsin(ax)}\sin(3\arcsin(ax))}{40a^3}$$

```
[Out] 1/8*exp(arcsin(a*x))*x/a^2-1/40*exp(arcsin(a*x))*cos(3*arcsin(a*x))/a^3-3/4
0*exp(arcsin(a*x))*sin(3*arcsin(a*x))/a^3+1/8*exp(arcsin(a*x))*(-a^2*x^2+1)
^(1/2)/a^3
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4920, 12, 4557, 4518}

$$\int e^{\arcsin(ax)}x^2\,dx=-\frac{3e^{\arcsin(ax)}\sin(3\arcsin(ax))}{40a^3}-\frac{e^{\arcsin(ax)}\cos(3\arcsin(ax))}{40a^3}+\frac{xe^{\arcsin(ax)}}{8a^2}+\frac{\sqrt{1-a^2x^2}e^{\arcsin(ax)}}{8a^3}$$

```
[In] Int[E^ArcSin[a*x]*x^2,x]
```

```
[Out] (E^ArcSin[a*x]*x)/(8*a^2) + (E^ArcSin[a*x]*Sqrt[1 - a^2*x^2])/(8*a^3) - (E^
ArcSin[a*x]*Cos[3*ArcSin[a*x]])/(40*a^3) - (3*E^ArcSin[a*x]*Sin[3*ArcSin[a*
x]])/(40*a^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)\sin^2(x)}{a^2}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sin^2(x)\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{4}e^x\cos(x)-\frac{1}{4}e^x\cos(3x)\right)\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\,dx, x, \arcsin(ax)\right)}{4a^3}-\frac{\text{Subst}\left(\int e^x \cos(3x)\,dx, x, \arcsin(ax)\right)}{4a^3}\\
&= \frac{e^{\arcsin(ax)}x}{8a^2}+\frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{8a^3}-\frac{e^{\arcsin(ax)}\cos(3\arcsin(ax))}{40a^3}-\frac{3e^{\arcsin(ax)}\sin(3\arcsin(ax))}{40a^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.61

$$\int e^{\arcsin(ax)}x^2\,dx = -\frac{e^{\arcsin(ax)}\left(-5ax-5\sqrt{1-a^2x^2}+\cos(3\arcsin(ax))+3\sin(3\arcsin(ax))\right)}{40a^3}$$

```
[In] Integrate[E^ArcSin[a*x]*x^2,x]
[Out] -1/40*(E^ArcSin[a*x]*(-5*a*x - 5*Sqrt[1 - a^2*x^2] + Cos[3*ArcSin[a*x]] + 3
*Sin[3*ArcSin[a*x]]))/a^3
```

Maple [F]

$$\int e^{\arcsin(ax)}x^2dx$$

```
[In] int(exp(arcsin(a*x))*x^2,x)
[Out] int(exp(arcsin(a*x))*x^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.55

$$\int e^{\arcsin(ax)}x^2\,dx = \frac{\left(3\,a^3x^3-ax+(a^2x^2+1)\sqrt{-a^2x^2+1}\right)e^{(\arcsin(ax))}}{10\,a^3}$$

```
[In] integrate(exp(arcsin(a*x))*x^2,x, algorithm="fricas")
[Out] 1/10*(3*a^3*x^3 - a*x + (a^2*x^2 + 1)*sqrt(-a^2*x^2 + 1))*e^(arcsin(a*x))/a
^3
```

Sympy [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.98

$$\int e^{\arcsin(ax)}x^2\,dx = \begin{cases} \frac{3x^3e^{\operatorname{asin}(ax)}}{10}+\frac{x^2\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{10a}-\frac{xe^{\operatorname{asin}(ax)}}{10a^2}+\frac{\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{10a^3} & \text{for } a\neq 0 \\ \frac{x^3}{3} & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x))*x**2,x)
[Out] Piecewise((3*x**3*exp(asin(a*x))/10 + x**2*sqrt(-a**2*x**2 + 1)*exp(asin(a*
x))/(10*a) - x*exp(asin(a*x))/(10*a**2) + sqrt(-a**2*x**2 + 1)*exp(asin(a*x
))/(10*a**3), Ne(a, 0)), (x**3/3, True))
```

Maxima [F]

$$\int e^{\arcsin(ax)}x^2\,dx = \int x^2 e^{(\arcsin(ax))}\,dx$$

```
[In] integrate(exp(arcsin(a*x))*x^2,x, algorithm="maxima")
[Out] integrate(x^2*e^(arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.93

$$\int e^{\arcsin(ax)}x^2\,dx = \frac{3\,(a^2x^2-1)xe^{(\arcsin(ax))}}{10\,a^2} + \frac{xe^{(\arcsin(ax))}}{5\,a^2} - \frac{(-a^2x^2+1)^{\frac{3}{2}}e^{(\arcsin(ax))}}{10\,a^3} + \frac{\sqrt{-a^2x^2+1}e^{(\arcsin(ax))}}{5\,a^3}$$

```
[In] integrate(exp(arcsin(a*x))*x^2,x, algorithm="giac")
[Out] 3/10*(a^2*x^2 - 1)*x*e^(arcsin(a*x))/a^2 + 1/5*x*e^(arcsin(a*x))/a^2 - 1/10
*(-a^2*x^2 + 1)^(3/2)*e^(arcsin(a*x))/a^3 + 1/5*sqrt(-a^2*x^2 + 1)*e^(arcsi
n(a*x))/a^3
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x^2\,dx = \int x^2\,\mathrm{e}^{\mathrm{asin}(a\,x)}\,dx$$

```
[In] int(x^2*exp(asin(a*x)),x)
[Out] int(x^2*exp(asin(a*x)), x)
```

3.441 $\int e^{\arcsin(ax)}x\,dx$

Optimal result

Integrand size = 8, antiderivative size = 41

$$\int e^{\arcsin(ax)}x\,dx=-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{5a^2}+\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{10a^2}$$

```
[Out] -1/5*exp(arcsin(a*x))*cos(2*arcsin(a*x))/a^2+1/10*exp(arcsin(a*x))*sin(2*ar
csin(a*x))/a^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4920, 12, 4557, 4517}

$$\int e^{\arcsin(ax)}x\,dx=\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{10a^2}-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{5a^2}$$

```
[In] Int[E^ArcSin[a*x]*x,x]
```

```
[Out] -1/5*(E^ArcSin[a*x]*Cos[2*ArcSin[a*x]])/a^2 + (E^ArcSin[a*x]*Sin[2*ArcSin[a
*x]])/(10*a^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
```

```
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)\sin(x)}{a}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sin(x)\,dx, x, \arcsin(ax)\right)}{a^2}\\
&= \frac{\text{Subst}\left(\int \frac{1}{2}e^x \sin(2x)\,dx, x, \arcsin(ax)\right)}{a^2}\\
&= \frac{\text{Subst}\left(\int e^x \sin(2x)\,dx, x, \arcsin(ax)\right)}{2a^2}\\
&= -\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{5a^2} + \frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{10a^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.73

$$\int e^{\arcsin(ax)}x\,dx = \frac{e^{\arcsin(ax)}(-2\cos(2\arcsin(ax)) + \sin(2\arcsin(ax)))}{10a^2}$$

```
[In] Integrate[E^ArcSin[a*x]*x,x]
[Out] (E^ArcSin[a*x]*(-2*Cos[2*ArcSin[a*x]] + Sin[2*ArcSin[a*x]]))/(10*a^2)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} x dx$$

```
[In] int(exp(arcsin(a*x))*x,x)
[Out] int(exp(arcsin(a*x))*x,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.85

$$\int e^{\arcsin(ax)} x\, dx = \frac{\left(2\, a^2 x^2 + \sqrt{-a^2 x^2 + 1} a x - 1\right) e^{(\arcsin(ax))}}{5\, a^2}$$

```
[In] integrate(exp(arcsin(a*x))*x,x, algorithm="fricas")
[Out] 1/5*(2*a^2*x^2 + sqrt(-a^2*x^2 + 1)*a*x - 1)*e^(arcsin(a*x))/a^2
```

Sympy [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.29

$$\int e^{\arcsin(ax)} x\, dx = \begin{cases} \frac{2x^2 e^{\operatorname{asin}(ax)}}{5} + \frac{x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{5a} - \frac{e^{\operatorname{asin}(ax)}}{5a^2} & \text{for } a \neq 0 \\ \frac{x^2}{2} & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x))*x,x)
[Out] Piecewise((2*x**2*exp(asin(a*x))/5 + x*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/
(5*a) - exp(asin(a*x))/(5*a**2), Ne(a, 0)), (x**2/2, True))
```

Maxima [F]

$$\int e^{\arcsin(ax)} x\, dx = \int x e^{(\arcsin(ax))}\, dx$$

```
[In] integrate(exp(arcsin(a*x))*x,x, algorithm="maxima")
[Out] integrate(x*e^(arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.29

$$\int e^{\arcsin(ax)}x\,dx = \frac{\sqrt{-a^2x^2+1}xe^{(\arcsin(ax))}}{5\,a} + \frac{2\,(a^2x^2-1)e^{(\arcsin(ax))}}{5\,a^2} + \frac{e^{(\arcsin(ax))}}{5\,a^2}$$

```
[In] integrate(exp(arcsin(a*x))*x,x, algorithm="giac")
[Out] 1/5*sqrt(-a^2*x^2 + 1)*x*e^(arcsin(a*x))/a + 2/5*(a^2*x^2 - 1)*e^(arcsin(a*
x))/a^2 + 1/5*e^(arcsin(a*x))/a^2
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x\,dx = \int x\,e^{\mathrm{asin}(a\,x)}\,dx$$

```
[In] int(x*exp(asin(a*x)),x)
[Out] int(x*exp(asin(a*x)), x)
```

3.442 $\int e^{\arcsin(ax)}\,dx$

Optimal result

Integrand size = 6, antiderivative size = 39

$$\int e^{\arcsin(ax)}\,dx=\frac{1}{2}e^{\arcsin(ax)}x+\frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{2a}$$

```
[Out] 1/2*exp(arcsin(a*x))*x+1/2*exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2)/a
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4920, 4518}

$$\int e^{\arcsin(ax)}\,dx=\frac{\sqrt{1-a^2x^2}e^{\arcsin(ax)}}{2a}+\frac{1}{2}xe^{\arcsin(ax)}$$

```
[In] Int[E^ArcSin[a*x],x]
```

```
[Out] (E^ArcSin[a*x]*x)/2 + (E^ArcSin[a*x]*Sqrt[1 - a^2*x^2])/(2*a)
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
```

```
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^x \cos(x)\,dx, x, \arcsin(ax)\right)}{a}$$
$$= \frac{1}{2}e^{\arcsin(ax)}x + \frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{2a}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)}\,dx = \frac{e^{\arcsin(ax)}\left(ax+\sqrt{1-a^2x^2}\right)}{2a}$$

```
[In] Integrate[E^ArcSin[a*x],x]
[Out] (E^ArcSin[a*x]*(a*x + Sqrt[1 - a^2*x^2]))/(2*a)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)}dx$$

```
[In] int(exp(arcsin(a*x)),x)
[Out] int(exp(arcsin(a*x)),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.67

$$\int e^{\arcsin(ax)}\,dx = \frac{\left(ax+\sqrt{-a^2x^2+1}\right)e^{(\arcsin(ax))}}{2\,a}$$

```
[In] integrate(exp(arcsin(a*x)),x, algorithm="fricas")
[Out] 1/2*(a*x + sqrt(-a^2*x^2 + 1))*e^(arcsin(a*x))/a
```

Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.82

$$\int e^{\arcsin(ax)}\,dx = \begin{cases} \frac{xe^{\operatorname{asin}(ax)}}{2} + \frac{\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{2a} & \text{for } a \neq 0 \\ x & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x)),x)
[Out] Piecewise((x*exp(asin(a*x))/2 + sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/(2*a),
Ne(a, 0)), (x, True))
```

Maxima [F]

$$\int e^{\arcsin(ax)}\,dx = \int e^{(\arcsin(ax))}\,dx$$

```
[In] integrate(exp(arcsin(a*x)),x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)}\,dx = \frac{1}{2}\,xe^{(\arcsin(ax))} + \frac{\sqrt{-a^2x^2+1}e^{(\arcsin(ax))}}{2\,a}$$

```
[In] integrate(exp(arcsin(a*x)),x, algorithm="giac")
[Out] 1/2*x*e^(arcsin(a*x)) + 1/2*sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}\,dx = \int \mathrm{e}^{\operatorname{asin}(a\,x)}\,dx$$

```
[In] int(exp(asin(a*x)),x)
[Out] int(exp(asin(a*x)), x)
```

3.443 $\int \frac{e^{\arcsin(ax)}}{x}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 43

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = ie^{\arcsin(ax)} - 2ie^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2},1,1-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

```
[Out] I*exp(arcsin(a*x))-2*I*exp(arcsin(a*x))*hypergeom([1, -1/2*I],[1-1/2*I],(I*
a*x+(-a^2*x^2+1)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4920, 12, 4528, 2225, 2283}

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = ie^{\arcsin(ax)} - 2ie^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2},1,1-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

```
[In] Int[E^ArcSin[a*x]/x,x]
```

```
[Out] I*E^ArcSin[a*x] - (2*I)*E^ArcSin[a*x]*Hypergeometric2F1[-1/2*I, 1, 1 - I/2,
 E^((2*I)*ArcSin[a*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2283

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[a^p*(G^(h*(f + g*x))/(g*h*Log[G]))*Hype
rgeometric2F1[-p, g*h*(Log[G]/(d*e*Log[F])), g*h*(Log[G]/(d*e*Log[F])) + 1,
 Simplify[(-b/a)*F^(e*(c + d*x))]], x] /; FreeQ[{F, G, a, b, c, d, e, f, g,
 h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 4528

```
Int[Cot[(d_.) + (e_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symb
ol] :> Dist[(-I)^n, Int[ExpandIntegrand[F^(c*(a + b*x))*((1 + E^(2*I*(d + e
*x)))^n/(1 - E^(2*I*(d + e*x)))^n), x], x], x] /; FreeQ[{F, a, b, c, d, e},
 x] && IntegerQ[n]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int ae^x \cot(x)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \text{Subst}\left(\int e^x \cot(x)\,dx, x, \arcsin(ax)\right)\\
&= -\left(i\text{Subst}\left(\int \left(-e^x - \frac{2e^x}{-1+e^{2ix}}\right)\,dx, x, \arcsin(ax)\right)\right)\\
&= i\text{Subst}\left(\int e^x\,dx, x, \arcsin(ax)\right) + 2i\text{Subst}\left(\int \frac{e^x}{-1+e^{2ix}}\,dx, x, \arcsin(ax)\right)\\
&= ie^{\arcsin(ax)} - 2ie^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2}, 1, 1-\frac{i}{2}, e^{2i\arcsin(ax)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.74

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = i\left(-e^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2}, 1, 1-\frac{i}{2}, e^{2i\arcsin(ax)}\right) - \left(\frac{1}{5} - \frac{2i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1, 1-\frac{i}{2}, 2-\frac{i}{2}, e^{2i\arcsin(ax)}\right)\right)$$

```
[In] Integrate[E^ArcSin[a*x]/x,x]
```

```
[Out] I*(-(E^ArcSin[a*x]*Hypergeometric2F1[-1/2*I, 1, 1 - I/2, E^((2*I)*ArcSin[a*
x])]) - (1/5 - (2*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1, 1 -
I/2, 2 - I/2, E^((2*I)*ArcSin[a*x])])
```

Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{x}dx$$

```
[In] int(exp(arcsin(a*x))/x,x)
```

```
[Out] int(exp(arcsin(a*x))/x,x)
```

Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/x,x, algorithm="fricas")
```

```
[Out] integral(e^(arcsin(a*x))/x, x)
```

Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{x}\,dx$$

```
[In] integrate(exp(asin(a*x))/x,x)
```

```
[Out] Integral(exp(asin(a*x))/x, x)
```

Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/x,x, algorithm="maxima")
```

```
[Out] integrate(e^(arcsin(a*x))/x, x)
```

Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

[In] integrate(exp(arcsin(a*x))/x,x, algorithm="giac")

[Out] integrate(e^(arcsin(a*x))/x, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{\mathrm{asin}(a\,x)}}{x}\,dx$$

[In] int(exp(asin(a*x))/x,x)

[Out] int(exp(asin(a*x))/x, x)

3.444 $\int \frac{e^{\arcsin(ax)}}{x^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 83

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = (1-i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right) - (2-2i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},2,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

```
[Out] (1-I)*a*exp((1+I)*arcsin(a*x))*hypergeom([1, 1/2-1/2*I],[3/2-1/2*I],(I*a*x+
(-a^2*x^2+1)^(1/2))^2)+(-2+2*I)*a*exp((1+I)*arcsin(a*x))*hypergeom([2, 1/2-
1/2*I],[3/2-1/2*I],(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4920, 12, 4559, 2283}

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = (1-i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right) - (2-2i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},2,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

```
[In] Int[E^ArcSin[a*x]/x^2,x]
```

```
[Out] (1 - I)*a*E^((1 + I)*ArcSin[a*x])*Hypergeometric2F1[1/2 - I/2, 1, 3/2 - I/2
, E^((2*I)*ArcSin[a*x])] - (2 - 2*I)*a*E^((1 + I)*ArcSin[a*x])*Hypergeometr
ic2F1[1/2 - I/2, 2, 3/2 - I/2, E^((2*I)*ArcSin[a*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2283

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[a^p*(G^(h*(f + g*x))/(g*h*Log[G]))*Hype
rgeometric2F1[-p, g*h*(Log[G]/(d*e*Log[F])), g*h*(Log[G]/(d*e*Log[F])) + 1,
 Simplify[(-b/a)*F^(e*(c + d*x))]], x] /; FreeQ[{F, G, a, b, c, d, e, f, g,
 h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 4559

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*(G_)[(d_.) + (e_.)*(x_)]^(m_.)*(H_)[(
d_.) + (e_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigToExp[F^(c*(a + b*x)),
 G[d + e*x]^m*H[d + e*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && IGtQ[
m, 0] && IGtQ[n, 0] && TrigQ[G] && TrigQ[H]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int a^2 e^x \cot(x)\csc(x)\,dx, x, \arcsin(ax)\right)}{a}\\
&= a\text{Subst}\left(\int e^x \cot(x)\csc(x)\,dx, x, \arcsin(ax)\right)\\
&= a\text{Subst}\left(\int \left(\frac{2e^{(1+i)x}}{1-e^{2ix}} - \frac{4e^{(1+i)x}}{\left(-1+e^{2ix}\right)^2}\right)\,dx, x, \arcsin(ax)\right)\\
&= (2a)\text{Subst}\left(\int \frac{e^{(1+i)x}}{1-e^{2ix}}\,dx, x, \arcsin(ax)\right) - (4a)\text{Subst}\left(\int \frac{e^{(1+i)x}}{\left(-1+e^{2ix}\right)^2}\,dx, x, \arcsin(ax)\right)\\
&= (1-i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2}, 1, \frac{3}{2}-\frac{i}{2}, e^{2i\arcsin(ax)}\right)\\
&\quad - (2-2i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2}, 2, \frac{3}{2}-\frac{i}{2}, e^{2i\arcsin(ax)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.65

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = -\frac{e^{\arcsin(ax)} + (1+i)ae^{(1+i)\arcsin(ax)}x\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)}{x}$$

```
[In] Integrate[E^ArcSin[a*x]/x^2,x]
[Out] -((E^ArcSin[a*x] + (1 + I)*a*E^((1 + I)*ArcSin[a*x])*x*Hypergeometric2F1[1/
2 - I/2, 1, 3/2 - I/2, E^((2*I)*ArcSin[a*x])])/x)
```

Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{x^2}dx$$

```
[In] int(exp(arcsin(a*x))/x^2,x)
[Out] int(exp(arcsin(a*x))/x^2,x)
```

Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{e^{(\arcsin(ax))}}{x^2}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/x^2,x, algorithm="fricas")
[Out] integral(e^(arcsin(a*x))/x^2, x)
```

Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{x^2}\,dx$$

```
[In] integrate(exp(asin(a*x))/x**2,x)
[Out] Integral(exp(asin(a*x))/x**2, x)
```

Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2} \, dx = \int \frac{e^{(\arcsin(ax))}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(a*x))/x^2,x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x))/x^2, x)
```

Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2} \, dx = \int \frac{e^{(\arcsin(ax))}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(a*x))/x^2,x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x))/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{x^2} \, dx = \int \frac{e^{\mathrm{asin}(a\,x)}}{x^2} \, dx$$

```
[In] int(exp(asin(a*x))/x^2,x)
[Out] int(exp(asin(a*x))/x^2, x)
```

3.445 $\int e^{\arcsin(ax)^2} x^3 \, dx$

Optimal result

Integrand size = 12, antiderivative size = 101

$$\int e^{\arcsin(ax)^2} x^3 \, dx = \frac{e\sqrt{\pi}\text{erf}(1 - i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 - i\arcsin(ax))}{32a^4} + \frac{e\sqrt{\pi}\text{erf}(1 + i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 + i\arcsin(ax))}{32a^4}$$

```
[Out] 1/16*I*exp(1)*erfi(-I+arcsin(a*x))*Pi^(1/2)/a^4-1/16*I*exp(1)*erfi(I+arcsin
(a*x))*Pi^(1/2)/a^4-1/32*I*exp(4)*erfi(-2*I+arcsin(a*x))*Pi^(1/2)/a^4+1/32*
I*exp(4)*erfi(2*I+arcsin(a*x))*Pi^(1/2)/a^4
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4920, 12, 4562, 2266, 2235}

$$\int e^{\arcsin(ax)^2} x^3 \, dx = \frac{e\sqrt{\pi}\text{erf}(1 - i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 - i\arcsin(ax))}{32a^4} + \frac{e\sqrt{\pi}\text{erf}(1 + i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 + i\arcsin(ax))}{32a^4}$$

```
[In] Int[E^ArcSin[a*x]^2*x^3,x]
```

```
[Out] (E*Sqrt[Pi]*Erf[1 - I*ArcSin[a*x]])/(16*a^4) - (E^4*Sqrt[Pi]*Erf[2 - I*ArcS
in[a*x]])/(32*a^4) + (E*Sqrt[Pi]*Erf[1 + I*ArcSin[a*x]])/(16*a^4) - (E^4*Sq
rt[Pi]*Erf[2 + I*ArcSin[a*x]])/(32*a^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)\sin^3(x)}{a^3}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin^3(x)\,dx, x, \arcsin(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{8}ie^{-2ix+x^2}-\frac{1}{8}ie^{2ix+x^2}-\frac{1}{16}ie^{-4ix+x^2}+\frac{1}{16}ie^{4ix+x^2}\right)dx, x, \arcsin(ax)\right)}{a^4}\\
&= -\frac{i\text{Subst}\left(\int e^{-4ix+x^2}\,dx, x, \arcsin(ax)\right)}{16a^4}+\frac{i\text{Subst}\left(\int e^{4ix+x^2}\,dx, x, \arcsin(ax)\right)}{16a^4}\\
&\quad+\frac{i\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(ax)\right)}{8a^4}-\frac{i\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(ax)\right)}{8a^4}
\end{aligned}
$$

$$= \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^4} - \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^4} - \frac{(ie^4)\,\text{Subst}\left(\int e^{\frac{1}{4}(-4i+2x)^2}\,dx, x, \arcsin(ax)\right)}{16a^4} + \frac{(ie^4)\,\text{Subst}\left(\int e^{\frac{1}{4}(4i+2x)^2}\,dx, x, \arcsin(ax)\right)}{16a^4}$$

$$= \frac{e\sqrt{\pi}\text{erf}(1 - i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 - i\arcsin(ax))}{32a^4} + \frac{e\sqrt{\pi}\text{erf}(1 + i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2 + i\arcsin(ax))}{32a^4}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.66

$$\int e^{\arcsin(ax)^2} x^3\,dx = \frac{e\sqrt{\pi}(2(\text{erf}(1 - i\arcsin(ax)) + \text{erf}(1 + i\arcsin(ax))) - e^3(\text{erf}(2 - i\arcsin(ax)) + \text{erf}(2 + i\arcsin(ax))))}{32a^4}$$

```
[In] Integrate[E^ArcSin[a*x]^2*x^3,x]
[Out] (E*Sqrt[Pi]*(2*(Erf[1 - I*ArcSin[a*x]] + Erf[1 + I*ArcSin[a*x]]) - E^3*(Erf
[2 - I*ArcSin[a*x]] + Erf[2 + I*ArcSin[a*x]])))/(32*a^4)
```

Maple [F]

$$\int e^{\arcsin(ax)^2} x^3 dx$$

```
[In] int(exp(arcsin(a*x)^2)*x^3,x)
[Out] int(exp(arcsin(a*x)^2)*x^3,x)
```

Fricas [F]

$$\int e^{\arcsin(ax)^2} x^3\,dx = \int x^3 e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="fricas")
[Out] integral(x^3*e^(arcsin(a*x)^2), x)
```

Sympy [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\operatorname{asin}^2(ax)}\,dx$$

```
[In] integrate(exp(asin(a*x)**2)*x**3,x)
[Out] Integral(x**3*exp(asin(a*x)**2), x)
```

Maxima [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="maxima")
[Out] integrate(x^3*e^(arcsin(a*x)^2), x)
```

Giac [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="giac")
[Out] integrate(x^3*e^(arcsin(a*x)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3\,\mathrm{e}^{\operatorname{asin}(a\,x)^2}\,dx$$

```
[In] int(x^3*exp(asin(a*x)^2),x)
[Out] int(x^3*exp(asin(a*x)^2), x)
```

3.446 $\int e^{\arcsin(ax)^2} x^2 \, dx$

Optimal result

Integrand size = 12, antiderivative size = 129

$$\int e^{\arcsin(ax)^2} x^2 \, dx = \frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{16a^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-3i+2\arcsin(ax))\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(3i+2\arcsin(ax))\right)}{16a^3}$$

```
[Out] 1/16*exp(1/4)*erfi(-1/2*I+arcsin(a*x))*Pi^(1/2)/a^3+1/16*exp(1/4)*erfi(1/2*
I+arcsin(a*x))*Pi^(1/2)/a^3-1/16*exp(9/4)*erfi(-3/2*I+arcsin(a*x))*Pi^(1/2)
/a^3-1/16*exp(9/4)*erfi(3/2*I+arcsin(a*x))*Pi^(1/2)/a^3
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4920, 12, 4562, 2266, 2235}

$$\int e^{\arcsin(ax)^2} x^2 \, dx = \frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(ax)-i)\right)}{16a^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(ax)+i)\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(ax)-3i)\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(ax)+3i)\right)}{16a^3}$$

```
[In] Int[E^ArcSin[a*x]^2*x^2,x]
```

```
[Out] (E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a*x])/2])/(16*a^3) + (E^(1/4)*Sqrt[Pi
]*Erfi[(I + 2*ArcSin[a*x])/2])/(16*a^3) - (E^(9/4)*Sqrt[Pi]*Erfi[(-3*I + 2*
ArcSin[a*x])/2])/(16*a^3) - (E^(9/4)*Sqrt[Pi]*Erfi[(3*I + 2*ArcSin[a*x])/2]
)/(16*a^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)\sin^2(x)}{a^2}\,dx,x,\arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin^2(x)\,dx,x,\arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{8}e^{-ix+x^2}+\frac{1}{8}e^{ix+x^2}-\frac{1}{8}e^{-3ix+x^2}-\frac{1}{8}e^{3ix+x^2}\right)\,dx,x,\arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int e^{-ix+x^2}\,dx,x,\arcsin(ax)\right)}{8a^3}+\frac{\text{Subst}\left(\int e^{ix+x^2}\,dx,x,\arcsin(ax)\right)}{8a^3}\\
&\quad-\frac{\text{Subst}\left(\int e^{-3ix+x^2}\,dx,x,\arcsin(ax)\right)}{8a^3}-\frac{\text{Subst}\left(\int e^{3ix+x^2}\,dx,x,\arcsin(ax)\right)}{8a^3}
\end{aligned}$$

$$= \frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^3} + \frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^3} - \frac{e^{9/4}\text{Subst}\left(\int e^{\frac{1}{4}(-3i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^3} - \frac{e^{9/4}\text{Subst}\left(\int e^{\frac{1}{4}(3i+2x)^2}\,dx, x, \arcsin(ax)\right)}{8a^3}$$

$$= \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{16a^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(ax))\right)}{16a^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(3i+2\arcsin(ax))\right)}{16a^3}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.65

$$\int e^{\arcsin(ax)^2}x^2\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\left(\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right) + \text{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right) - e^2\left(\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(ax))\right) + \text{erfi}\left(\frac{1}{2}(3i\right.\right.\right.}{16a^3}$$

```
[In] Integrate[E^ArcSin[a*x]^2*x^2,x]
[Out] (E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a*x])/2] + Erfi[(I + 2*ArcSin[a*x])/
2] - E^2*(Erfi[(-3*I + 2*ArcSin[a*x])/2] + Erfi[(3*I + 2*ArcSin[a*x])/2])))
/(16*a^3)
```

Maple [F]

$$\int e^{\arcsin(ax)^2}x^2dx$$

```
[In] int(exp(arcsin(a*x)^2)*x^2,x)
[Out] int(exp(arcsin(a*x)^2)*x^2,x)
```

Fricas [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx = \int x^2e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="fricas")
[Out] integral(x^2*e^(arcsin(a*x)^2), x)
```

Sympy [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx = \int x^2e^{\operatorname{asin}^2(ax)}\,dx$$

```
[In] integrate(exp(asin(a*x)**2)*x**2,x)
[Out] Integral(x**2*exp(asin(a*x)**2), x)
```

Maxima [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx = \int x^2e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="maxima")
[Out] integrate(x^2*e^(arcsin(a*x)^2), x)
```

Giac [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx = \int x^2e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="giac")
[Out] integrate(x^2*e^(arcsin(a*x)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x^2\,dx = \int x^2\,\mathrm{e}^{\operatorname{asin}(a\,x)^2}\,dx$$

```
[In] int(x^2*exp(asin(a*x)^2),x)
[Out] int(x^2*exp(asin(a*x)^2), x)
```

3.447 $\int e^{\arcsin(ax)^2} x\,dx$

Optimal result

Integrand size = 10, antiderivative size = 49

$$\int e^{\arcsin(ax)^2} x\,dx = \frac{e\sqrt{\pi}\operatorname{erf}(1-i\arcsin(ax))}{8a^2} + \frac{e\sqrt{\pi}\operatorname{erf}(1+i\arcsin(ax))}{8a^2}$$

```
[Out] 1/8*I*exp(1)*erfi(-I+arcsin(a*x))*Pi^(1/2)/a^2-1/8*I*exp(1)*erfi(I+arcsin(a
*x))*Pi^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4920, 12, 4562, 2266, 2235}

$$\int e^{\arcsin(ax)^2} x\,dx = \frac{e\sqrt{\pi}\operatorname{erf}(1-i\arcsin(ax))}{8a^2} + \frac{e\sqrt{\pi}\operatorname{erf}(1+i\arcsin(ax))}{8a^2}$$

```
[In] Int[E^ArcSin[a*x]^2*x,x]
```

```
[Out] (E*Sqrt[Pi]*Erf[1 - I*ArcSin[a*x]])/(8*a^2) + (E*Sqrt[Pi]*Erf[1 + I*ArcSin[
a*x]])/(8*a^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)\sin(x)}{a}\,dx, x, \arcsin(ax)\right)}{a}$$

$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin(x)\,dx, x, \arcsin(ax)\right)}{a^2}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{4}ie^{-2ix+x^2} - \frac{1}{4}ie^{2ix+x^2}\right)\,dx, x, \arcsin(ax)\right)}{a^2}$$

$$= \frac{i\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(ax)\right)}{4a^2} - \frac{i\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(ax)\right)}{4a^2}$$

$$= \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(ax)\right)}{4a^2} - \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(ax)\right)}{4a^2}$$

$$= \frac{e\sqrt{\pi}\text{erf}(1 - i\arcsin(ax))}{8a^2} + \frac{e\sqrt{\pi}\text{erf}(1 + i\arcsin(ax))}{8a^2}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.73

$$\int e^{\arcsin(ax)^2}x\,dx=\frac{e\sqrt{\pi}(\text{erf}(1-i\arcsin(ax))+\text{erf}(1+i\arcsin(ax)))}{8a^2}$$

```
[In] Integrate[E^ArcSin[a*x]^2*x,x]
[Out] (E*Sqrt[Pi]*(Erf[1 - I*ArcSin[a*x]] + Erf[1 + I*ArcSin[a*x]]))/(8*a^2)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)^2}x dx$$

```
[In] int(exp(arcsin(a*x)^2)*x,x)
[Out] int(exp(arcsin(a*x)^2)*x,x)
```

Fricas [F]

$$\int e^{\arcsin(ax)^2}x\,dx=\int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x,x, algorithm="fricas")
[Out] integral(x*e^(arcsin(a*x)^2), x)
```

Sympy [F]

$$\int e^{\arcsin(ax)^2}x\,dx=\int xe^{\operatorname{asin}^2(ax)}\,dx$$

```
[In] integrate(exp(asin(a*x)**2)*x,x)
[Out] Integral(x*exp(asin(a*x)**2), x)
```

Maxima [F]

$$\int e^{\arcsin(ax)^2}x\,dx = \int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x,x, algorithm="maxima")
[Out] integrate(x*e^(arcsin(a*x)^2), x)
```

Giac [F]

$$\int e^{\arcsin(ax)^2}x\,dx = \int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)*x,x, algorithm="giac")
[Out] integrate(x*e^(arcsin(a*x)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x\,dx = \int x\,\mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

```
[In] int(x*exp(asin(a*x)^2),x)
[Out] int(x*exp(asin(a*x)^2), x)
```

3.448 $\int e^{\arcsin(ax)^2}\,dx$

Optimal result

Integrand size = 8, antiderivative size = 65

$$\int e^{\arcsin(ax)^2}\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{4a}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{4a}$$

```
[Out] 1/4*exp(1/4)*erfi(-1/2*I+arcsin(a*x))*Pi^(1/2)/a+1/4*exp(1/4)*erfi(1/2*I+ar
csin(a*x))*Pi^(1/2)/a
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4920, 4561, 2266, 2235}

$$\int e^{\arcsin(ax)^2}\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)-i)\right)}{4a}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)+i)\right)}{4a}$$

```
[In] Int[E^ArcSin[a*x]^2,x]
```

```
[Out] (E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a*x])/2])/(4*a) + (E^(1/4)*Sqrt[Pi]*E
rfi[(I + 2*ArcSin[a*x])/2])/(4*a)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4561

```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2}e^{-ix+x^2}+\frac{1}{2}e^{ix+x^2}\right)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(ax)\right)}{2a}+\frac{\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(ax)\right)}{2a}\\
&= \frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(ax)\right)}{2a}+\frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(ax)\right)}{2a}\\
&= \frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{4a}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{4a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.74

$$\int e^{\arcsin(ax)^2}\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\left(\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)+\text{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)\right)}{4a}$$

```
[In] Integrate[E^ArcSin[a*x]^2,x]
[Out] (E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a*x])/2] + Erfi[(I + 2*ArcSin[a*x])/
2]))/(4*a)
```

Maple [F]

$$\int e^{\arcsin(ax)^2} dx$$

[In] int(exp(arcsin(a*x)^2),x)

[Out] int(exp(arcsin(a*x)^2),x)

Fricas [F]

$$\int e^{\arcsin(ax)^2} \, dx = \int e^{\left(\arcsin(ax)^2\right)} \, dx$$

[In] integrate(exp(arcsin(a*x)^2),x, algorithm="fricas")

[Out] integral(e^(arcsin(a*x)^2), x)

Sympy [F]

$$\int e^{\arcsin(ax)^2} \, dx = \int e^{\operatorname{asin}^2(ax)} \, dx$$

[In] integrate(exp(asin(a*x)**2),x)

[Out] Integral(exp(asin(a*x)**2), x)

Maxima [F]

$$\int e^{\arcsin(ax)^2} \, dx = \int e^{\left(\arcsin(ax)^2\right)} \, dx$$

[In] integrate(exp(arcsin(a*x)^2),x, algorithm="maxima")

[Out] integrate(e^(arcsin(a*x)^2), x)

Giac [F]

$$\int e^{\arcsin(ax)^2}\,dx = \int e^{\left(\arcsin(ax)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2),x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}\,dx = \int \mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

```
[In] int(exp(asin(a*x)^2),x)
[Out] int(exp(asin(a*x)^2), x)
```

3.449 $\int \frac{e^{\arcsin(ax)^2}}{x} dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(ax)^2}}{x} dx = a\text{Int}\left(\frac{e^{\arcsin(ax)^2}}{ax}, x\right)$$

```
[Out] a*CannotIntegrate(exp(arcsin(a*x)^2)/a/x,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\arcsin(ax)^2}}{x} dx = \int \frac{e^{\arcsin(ax)^2}}{x} dx$$

```
[In] Int[E^ArcSin[a*x]^2/x,x]
```

```
[Out] Defer[Subst][Defer[Int][E^x^2*Cot[x], x], x, ArcSin[a*x]]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int ae^{x^2}\cot(x)\,dx, x, \arcsin(ax)\right)}{a} \\ &= \text{Subst}\left(\int e^{x^2}\cot(x)\,dx, x, \arcsin(ax)\right) \end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\arcsin(ax)^2}}{x}\,dx$$

```
[In] Integrate[E^ArcSin[a*x]^2/x,x]
[Out] Integrate[E^ArcSin[a*x]^2/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(ax)^2}}{x}dx$$

```
[In] int(exp(arcsin(a*x)^2)/x,x)
[Out] int(exp(arcsin(a*x)^2)/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x,x, algorithm="fricas")
[Out] integral(e^(arcsin(a*x)^2)/x, x)
```

Sympy [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\operatorname{asin}^2(ax)}}{x}\,dx$$

```
[In] integrate(exp(asin(a*x)**2)/x,x)
[Out] Integral(exp(asin(a*x)**2)/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x,x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x)^2)/x, x)
```

Giac [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x,x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x)^2)/x, x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)^2}}{x}\,dx$$

```
[In] int(exp(asin(a*x)^2)/x,x)
[Out] int(exp(asin(a*x)^2)/x, x)
```

3.450 $\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = a^2\text{Int}\left(\frac{e^{\arcsin(ax)^2}}{a^2x^2},x\right)$$

```
[Out] a^2*CannotIntegrate(exp(arcsin(a*x)^2)/a^2/x^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx$$

```
[In] Int[E^ArcSin[a*x]^2/x^2,x]
[Out] a*Defer[Subst][Defer[Int][E^x^2*Cot[x]*Csc[x], x], x, ArcSin[a*x]]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int a^2e^{x^2}\cot(x)\csc(x)\,dx,x,\arcsin(ax)\right)}{a}\\ &= a\text{Subst}\left(\int e^{x^2}\cot(x)\csc(x)\,dx,x,\arcsin(ax)\right)\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 1.47 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx$$

```
[In] Integrate[E^ArcSin[a*x]^2/x^2,x]
[Out] Integrate[E^ArcSin[a*x]^2/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(ax)^2}}{x^2}dx$$

```
[In] int(exp(arcsin(a*x)^2)/x^2,x)
[Out] int(exp(arcsin(a*x)^2)/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2}\,dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="fricas")
[Out] integral(e^(arcsin(a*x)^2)/x^2, x)
```

Sympy [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}^2(ax)}}{x^2}\,dx$$

```
[In] integrate(exp(asin(a*x)**2)/x**2,x)
[Out] Integral(exp(asin(a*x)**2)/x**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2} \, dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x)^2)/x^2, x)
```

Giac [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2} \, dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x)^2)/x^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2} \, dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)^2}}{x^2} \, dx$$

```
[In] int(exp(asin(a*x)^2)/x^2,x)
[Out] int(exp(asin(a*x)^2)/x^2, x)
```

3.451 $\int e^{\arcsin(a+bx)}x^3\,dx$

Optimal result

Integrand size = 12, antiderivative size = 309

$$\begin{aligned}\int e^{\arcsin(a+bx)}x^3\,dx = & -\frac{3ae^{\arcsin(a+bx)}(a+bx)}{8b^4}-\frac{a^3e^{\arcsin(a+bx)}(a+bx)}{2b^4}\\ & -\frac{3ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^4}-\frac{a^3e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^4}\\ & -\frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{10b^4}\\ & -\frac{3a^2e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^4}\\ & +\frac{3ae^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^4}\\ & +\frac{e^{\arcsin(a+bx)}\cos(4\arcsin(a+bx))}{34b^4}+\frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{20b^4}\\ & +\frac{3a^2e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^4}\\ & +\frac{9ae^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^4}\\ & -\frac{e^{\arcsin(a+bx)}\sin(4\arcsin(a+bx))}{136b^4}\end{aligned}$$

```
[Out] -3/8*a*exp(arcsin(b*x+a))*(b*x+a)/b^4-1/2*a^3*exp(arcsin(b*x+a))*(b*x+a)/b^
4-1/10*exp(arcsin(b*x+a))*cos(2*arcsin(b*x+a))/b^4-3/5*a^2*exp(arcsin(b*x+a
))*cos(2*arcsin(b*x+a))/b^4+3/40*a*exp(arcsin(b*x+a))*cos(3*arcsin(b*x+a))/
b^4+1/34*exp(arcsin(b*x+a))*cos(4*arcsin(b*x+a))/b^4+1/20*exp(arcsin(b*x+a)
)*sin(2*arcsin(b*x+a))/b^4+3/10*a^2*exp(arcsin(b*x+a))*sin(2*arcsin(b*x+a))
/b^4+9/40*a*exp(arcsin(b*x+a))*sin(3*arcsin(b*x+a))/b^4-1/136*exp(arcsin(b*
x+a))*sin(4*arcsin(b*x+a))/b^4-3/8*a*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)
/b^4-1/2*a^3*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^4
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4920, 6873, 12, 6874, 4518, 4557, 4517}

$$\int e^{\arcsin(a+bx)}x^3\,dx = -\frac{a^3(a+bx)e^{\arcsin(a+bx)}}{2b^4}-\frac{a^3\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{2b^4}+\frac{3a^2e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^4}-\frac{3a^2e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^4}-\frac{3a(a+bx)e^{\arcsin(a+bx)}}{8b^4}-\frac{3a\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{8b^4}+\frac{9ae^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^4}+\frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{20b^4}-\frac{e^{\arcsin(a+bx)}\sin(4\arcsin(a+bx))}{136b^4}+\frac{3ae^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^4}-\frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{10b^4}+\frac{e^{\arcsin(a+bx)}\cos(4\arcsin(a+bx))}{34b^4}$$

```
[In] Int[E^ArcSin[a + b*x]*x^3,x]
```

```
[Out] (-3*a*E^ArcSin[a + b*x]*(a + b*x))/(8*b^4) - (a^3*E^ArcSin[a + b*x]*(a + b*
x))/(2*b^4) - (3*a*E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2])/(8*b^4) - (a^3*
E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2])/(2*b^4) - (E^ArcSin[a + b*x]*Cos[2
*ArcSin[a + b*x]])/(10*b^4) - (3*a^2*E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x
]])/(5*b^4) + (3*a*E^ArcSin[a + b*x]*Cos[3*ArcSin[a + b*x]])/(40*b^4) + (E^
ArcSin[a + b*x]*Cos[4*ArcSin[a + b*x]])/(34*b^4) + (E^ArcSin[a + b*x]*Sin[2
*ArcSin[a + b*x]])/(20*b^4) + (3*a^2*E^ArcSin[a + b*x]*Sin[2*ArcSin[a + b*x
]])/(10*b^4) + (9*a*E^ArcSin[a + b*x]*Sin[3*ArcSin[a + b*x]])/(40*b^4) - (E
^ArcSin[a + b*x]*Sin[4*ArcSin[a + b*x]])/(136*b^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^x \cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^3 dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)(-a+\sin(x))^3}{b^3} dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int e^x \cos(x)(-a+\sin(x))^3 dx, x, \arcsin(a+bx)\right)}{b^4}$$

$$= \frac{\text{Subst}\left(\int \left(-a^3 e^x \cos(x)+3a^2 e^x \cos(x)\sin(x)-3ae^x \cos(x)\sin^2(x)+e^x \cos(x)\sin^3(x)\right) dx, x, \text{arcsin}\right.}{b^4}$$

$$
\begin{aligned}
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sin^3(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&\quad - \frac{(3a)\text{Subst}\left(\int e^x \cos(x)\sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&\quad + \frac{(3a^2)\,\text{Subst}\left(\int e^x \cos(x)\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&\quad - \frac{a^3\text{Subst}\left(\int e^x \cos(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&= -\frac{a^3 e^{\arcsin(a+bx)}(a+bx)}{2b^4} - \frac{a^3 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^4} \\
&\quad + \frac{\text{Subst}\left(\int \left(\frac{1}{4}e^x\sin(2x) - \frac{1}{8}e^x\sin(4x)\right)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&\quad - \frac{(3a)\text{Subst}\left(\int \left(\frac{1}{4}e^x\cos(x) - \frac{1}{4}e^x\cos(3x)\right)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&\quad + \frac{(3a^2)\,\text{Subst}\left(\int \frac{1}{2}e^x\sin(2x)\,dx, x, \arcsin(a+bx)\right)}{b^4} \\
&= -\frac{a^3 e^{\arcsin(a+bx)}(a+bx)}{2b^4} - \frac{a^3 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^4} \\
&\quad - \frac{\text{Subst}\left(\int e^x\sin(4x)\,dx, x, \arcsin(a+bx)\right)}{8b^4} \\
&\quad + \frac{\text{Subst}\left(\int e^x\sin(2x)\,dx, x, \arcsin(a+bx)\right)}{4b^4} \\
&\quad - \frac{(3a)\text{Subst}\left(\int e^x\cos(x)\,dx, x, \arcsin(a+bx)\right)}{4b^4} \\
&\quad + \frac{(3a)\text{Subst}\left(\int e^x\cos(3x)\,dx, x, \arcsin(a+bx)\right)}{4b^4} \\
&\quad + \frac{(3a^2)\,\text{Subst}\left(\int e^x\sin(2x)\,dx, x, \arcsin(a+bx)\right)}{2b^4} \\
&= -\frac{3ae^{\arcsin(a+bx)}(a+bx)}{8b^4} - \frac{a^3 e^{\arcsin(a+bx)}(a+bx)}{2b^4} \\
&\quad - \frac{3ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^4} - \frac{a^3 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^4} \\
&\quad - \frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{10b^4} - \frac{3a^2 e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^4} \\
&\quad + \frac{3ae^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^4} + \frac{e^{\arcsin(a+bx)}\cos(4\arcsin(a+bx))}{34b^4} \\
&\quad + \frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{20b^4} + \frac{3a^2 e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^4} \\
&\quad + \frac{9ae^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^4} - \frac{e^{\arcsin(a+bx)}\sin(4\arcsin(a+bx))}{136b^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.48

$$\int e^{\arcsin(a+bx)}x^3\,dx$$
$$= \frac{e^{\arcsin(a+bx)}\left(-255a(a+bx)-340a^3(a+bx)-85a(3+4a^2)\sqrt{1-(a+bx)^2}-68(1+6a^2)\cos(2\arcsin(a\right.}{}$$

[In] Integrate[E^ArcSin[a + b*x]*x^3,x]

[Out] (E^ArcSin[a + b*x]*(-255*a*(a + b*x) - 340*a^3*(a + b*x) - 85*a*(3 + 4*a^2)*Sqrt[1 - (a + b*x)^2] - 68*(1 + 6*a^2)*Cos[2*ArcSin[a + b*x]] + 51*a*Cos[3*ArcSin[a + b*x]] + 20*Cos[4*ArcSin[a + b*x]] + 34*Sin[2*ArcSin[a + b*x]] + 204*a^2*Sin[2*ArcSin[a + b*x]] + 153*a*Sin[3*ArcSin[a + b*x]] - 5*Sin[4*ArcSin[a + b*x]]))/(680*b^4)

Maple [F]

$$\int e^{\arcsin(bx+a)}x^3dx$$

[In] int(exp(arcsin(b*x+a))*x^3,x)

[Out] int(exp(arcsin(b*x+a))*x^3,x)

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.42

$$\int e^{\arcsin(a+bx)}x^3\,dx$$
$$= \frac{(40\,b^4x^4+7\,ab^3x^3-3\,(5\,a^2+2)b^2x^2+6\,a^4+3\,(8\,a^3+13\,a)bx-57\,a^2+(10\,b^3x^3-21\,ab^2x^2-24\,a^3+6\,(5}{170\,b^4}$$

[In] integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="fricas")

[Out] 1/170*(40*b^4*x^4 + 7*a*b^3*x^3 - 3*(5*a^2 + 2)*b^2*x^2 + 6*a^4 + 3*(8*a^3 + 13*a)*b*x - 57*a^2 + (10*b^3*x^3 - 21*a*b^2*x^2 - 24*a^3 + 6*(5*a^2 + 2)*b*x - 39*a)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1) - 12)*e^(arcsin(b*x + a))/b^4

Sympy [A] (verification not implemented)

Time = 0.61 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.35

$$\int e^{\arcsin(a+bx)}x^3\,dx$$
$$=\begin{cases} \frac{3a^4e^{\operatorname{asin}(a+bx)}}{85b^4}+\frac{12a^3xe^{\operatorname{asin}(a+bx)}}{85b^3}-\frac{12a^3\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{85b^4}-\frac{3a^2x^2e^{\operatorname{asin}(a+bx)}}{34b^2}+\frac{3a^2x\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{17b^3} \\ \frac{x^4e^{\operatorname{asin}(a)}}{4} \end{cases}$$

```
[In] integrate(exp(asin(b*x+a))*x**3,x)
```

```
[Out] Piecewise((3*a**4*exp(asin(a + b*x))/(85*b**4) + 12*a**3*x*exp(asin(a + b*x
))/(85*b**3) - 12*a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b
*x))/(85*b**4) - 3*a**2*x**2*exp(asin(a + b*x))/(34*b**2) + 3*a**2*x*sqrt(-
a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(17*b**3) - 57*a**2*exp(
asin(a + b*x))/(170*b**4) + 7*a*x**3*exp(asin(a + b*x))/(170*b) - 21*a*x**2
*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(170*b**2) + 39*a
*x*exp(asin(a + b*x))/(170*b**3) - 39*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 +
1)*exp(asin(a + b*x))/(170*b**4) + 4*x**4*exp(asin(a + b*x))/17 + x**3*sqrt
(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(17*b) - 3*x**2*exp(as
in(a + b*x))/(85*b**2) + 6*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin
(a + b*x))/(85*b**3) - 6*exp(asin(a + b*x))/(85*b**4), Ne(b, 0)), (x**4*exp
(asin(a))/4, True))
```

Maxima [F]

$$\int e^{\arcsin(a+bx)}x^3\,dx=\int x^3e^{(\arcsin(bx+a))}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="maxima")
```

```
[Out] integrate(x^3*e^(arcsin(b*x + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.08

$$\int e^{\arcsin(a+bx)}x^3\,dx = -\frac{(bx+a)a^3e^{(\arcsin(bx+a))}}{2\,b^4} + \frac{3\,\sqrt{-(bx+a)^2+1}(bx+a)a^2e^{(\arcsin(bx+a))}}{5\,b^4} - \frac{\sqrt{-(bx+a)^2+1}a^3e^{(\arcsin(bx+a))}}{2\,b^4} - \frac{9\left((bx+a)^2-1\right)(bx+a)ae^{(\arcsin(bx+a))}}{10\,b^4} + \frac{6\left((bx+a)^2-1\right)a^2e^{(\arcsin(bx+a))}}{5\,b^4} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a)e^{(\arcsin(bx+a))}}{17\,b^4} + \frac{3\left(-(bx+a)^2+1\right)^{\frac{3}{2}}ae^{(\arcsin(bx+a))}}{10\,b^4} + \frac{4\left((bx+a)^2-1\right)^2e^{(\arcsin(bx+a))}}{17\,b^4} - \frac{3\,(bx+a)ae^{(\arcsin(bx+a))}}{5\,b^4} + \frac{3\,a^2e^{(\arcsin(bx+a))}}{5\,b^4} + \frac{11\,\sqrt{-(bx+a)^2+1}(bx+a)e^{(\arcsin(bx+a))}}{85\,b^4} - \frac{3\,\sqrt{-(bx+a)^2+1}ae^{(\arcsin(bx+a))}}{5\,b^4} + \frac{37\left((bx+a)^2-1\right)e^{(\arcsin(bx+a))}}{85\,b^4} + \frac{11\,e^{(\arcsin(bx+a))}}{85\,b^4}$$

```
[In] integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="giac")
```

```
[Out] -1/2*(b*x + a)*a^3*e^(arcsin(b*x + a))/b^4 + 3/5*sqrt(-(b*x + a)^2 + 1)*(b*
x + a)*a^2*e^(arcsin(b*x + a))/b^4 - 1/2*sqrt(-(b*x + a)^2 + 1)*a^3*e^(arcs
in(b*x + a))/b^4 - 9/10*((b*x + a)^2 - 1)*(b*x + a)*a*e^(arcsin(b*x + a))/b
^4 + 6/5*((b*x + a)^2 - 1)*a^2*e^(arcsin(b*x + a))/b^4 - 1/17*(-(b*x + a)^2
 + 1)^(3/2)*(b*x + a)*e^(arcsin(b*x + a))/b^4 + 3/10*(-(b*x + a)^2 + 1)^(3/
2)*a*e^(arcsin(b*x + a))/b^4 + 4/17*((b*x + a)^2 - 1)^2*e^(arcsin(b*x + a))
/b^4 - 3/5*(b*x + a)*a*e^(arcsin(b*x + a))/b^4 + 3/5*a^2*e^(arcsin(b*x + a)
)/b^4 + 11/85*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*e^(arcsin(b*x + a))/b^4 - 3/
5*sqrt(-(b*x + a)^2 + 1)*a*e^(arcsin(b*x + a))/b^4 + 37/85*((b*x + a)^2 - 1
)*e^(arcsin(b*x + a))/b^4 + 11/85*e^(arcsin(b*x + a))/b^4
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x^3\,dx = \int x^3\,\mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

```
[In] int(x^3*exp(asin(a + b*x)),x)
[Out] int(x^3*exp(asin(a + b*x)), x)
```

3.452 $\int e^{\arcsin(a+bx)}x^2\,dx$

Optimal result

Integrand size = 12, antiderivative size = 205

$$\int e^{\arcsin(a+bx)}x^2\,dx = \frac{e^{\arcsin(a+bx)}(a+bx)}{8b^3}+\frac{a^2e^{\arcsin(a+bx)}(a+bx)}{2b^3}+\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^3}+\frac{a^2e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^3}+\frac{2ae^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^3}-\frac{e^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^3}-\frac{ae^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{5b^3}-\frac{3e^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^3}$$

```
[Out] 1/8*exp(arcsin(b*x+a))*(b*x+a)/b^3+1/2*a^2*exp(arcsin(b*x+a))*(b*x+a)/b^3+2
/5*a*exp(arcsin(b*x+a))*cos(2*arcsin(b*x+a))/b^3-1/40*exp(arcsin(b*x+a))*co
s(3*arcsin(b*x+a))/b^3-1/5*a*exp(arcsin(b*x+a))*sin(2*arcsin(b*x+a))/b^3-3/
40*exp(arcsin(b*x+a))*sin(3*arcsin(b*x+a))/b^3+1/8*exp(arcsin(b*x+a))*(1-(b
*x+a)^2)^(1/2)/b^3+1/2*a^2*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^3
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used

$= \{4920, 6873, 12, 6874, 4518, 4557, 4517\}$

$$\int e^{\arcsin(a+bx)}x^2\,dx = \frac{a^2(a+bx)e^{\arcsin(a+bx)}}{2b^3} + \frac{a^2\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{2b^3} + \frac{(a+bx)e^{\arcsin(a+bx)}}{8b^3} + \frac{\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{8b^3} - \frac{ae^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{5b^3} - \frac{3e^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^3} + \frac{2ae^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^3} - \frac{e^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^3}$$

```
[In] Int[E^ArcSin[a + b*x]*x^2,x]
```

```
[Out] (E^ArcSin[a + b*x]*(a + b*x))/(8*b^3) + (a^2*E^ArcSin[a + b*x]*(a + b*x))/(
2*b^3) + (E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2])/(8*b^3) + (a^2*E^ArcSin[
a + b*x]*Sqrt[1 - (a + b*x)^2])/(2*b^3) + (2*a*E^ArcSin[a + b*x]*Cos[2*ArcS
in[a + b*x]])/(5*b^3) - (E^ArcSin[a + b*x]*Cos[3*ArcSin[a + b*x]])/(40*b^3)
 - (a*E^ArcSin[a + b*x]*Sin[2*ArcSin[a + b*x]])/(5*b^3) - (3*E^ArcSin[a + b
*x]*Sin[3*ArcSin[a + b*x]])/(40*b^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
```

```
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^x \cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2 dx, x, \arcsin(a+bx)\right)}{b} \\
&= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)(a-\sin(x))^2}{b^2} dx, x, \arcsin(a+bx)\right)}{b} \\
&= \frac{\text{Subst}\left(\int e^x \cos(x)(a-\sin(x))^2 dx, x, \arcsin(a+bx)\right)}{b^3} \\
&= \frac{\text{Subst}\left(\int \left(a^2 e^x \cos(x) - 2ae^x \cos(x)\sin(x) + e^x \cos(x)\sin^2(x)\right) dx, x, \arcsin(a+bx)\right)}{b^3} \\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sin^2(x)\, dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad - \frac{(2a)\text{Subst}\left(\int e^x \cos(x)\sin(x)\, dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad + \frac{a^2\text{Subst}\left(\int e^x \cos(x)\, dx, x, \arcsin(a+bx)\right)}{b^3} \\
&= \frac{a^2 e^{\arcsin(a+bx)}(a+bx)}{2b^3} + \frac{a^2 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^3} \\
&\quad + \frac{\text{Subst}\left(\int \left(\frac{1}{4}e^x \cos(x) - \frac{1}{4}e^x \cos(3x)\right) dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad - \frac{(2a)\text{Subst}\left(\int \frac{1}{2}e^x \sin(2x)\, dx, x, \arcsin(a+bx)\right)}{b^3}
\end{aligned}$$

$$= \frac{a^2 e^{\arcsin(a+bx)}(a+bx)}{2b^3} + \frac{a^2 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^3} + \frac{\text{Subst}\left(\int e^x \cos(x)\,dx, x, \arcsin(a+bx)\right)}{4b^3} - \frac{\text{Subst}\left(\int e^x \cos(3x)\,dx, x, \arcsin(a+bx)\right)}{4b^3} - \frac{a\text{Subst}\left(\int e^x \sin(2x)\,dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{e^{\arcsin(a+bx)}(a+bx)}{8b^3} + \frac{a^2 e^{\arcsin(a+bx)}(a+bx)}{2b^3} + \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^3} + \frac{a^2 e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^3} + \frac{2ae^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^3} - \frac{e^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^3} - \frac{ae^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{5b^3} - \frac{3e^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^3}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.50

$$\int e^{\arcsin(a+bx)}x^2\,dx$$

$$= \frac{e^{\arcsin(a+bx)}\left(5(a+bx)+20a^2(a+bx)+5(1+4a^2)\sqrt{1-(a+bx)^2}+16a\cos(2\arcsin(a+bx))-\cos(3\,\text{a}\right.}{40b^3}$$

```
[In] Integrate[E^ArcSin[a + b*x]*x^2,x]
```

```
[Out] (E^ArcSin[a + b*x]*(5*(a + b*x) + 20*a^2*(a + b*x) + 5*(1 + 4*a^2)*Sqrt[1 -
 (a + b*x)^2] + 16*a*Cos[2*ArcSin[a + b*x]] - Cos[3*ArcSin[a + b*x]] - 8*a*
Sin[2*ArcSin[a + b*x]] - 3*Sin[3*ArcSin[a + b*x]]))/(40*b^3)
```

Maple [F]

$$\int e^{\arcsin(bx+a)}x^2dx$$

```
[In] int(exp(arcsin(b*x+a))*x^2,x)
```

```
[Out] int(exp(arcsin(b*x+a))*x^2,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.41

$$\int e^{\arcsin(a+bx)}x^2\,dx = \frac{\left(3\,b^3x^3+ab^2x^2-(2\,a^2+1)bx+(b^2x^2-2\,abx+2\,a^2+1)\sqrt{-b^2x^2-2\,abx-a^2+1}+3\,a\right)e^{(\arcsin(bx+a))}}{10\,b^3}$$

```
[In] integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="fricas")
```

```
[Out] 1/10*(3*b^3*x^3 + a*b^2*x^2 - (2*a^2 + 1)*b*x + (b^2*x^2 - 2*a*b*x + 2*a^2
+ 1)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1) + 3*a)*e^(arcsin(b*x + a))/b^3
```

Sympy [A] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.19

$$\int e^{\arcsin(a+bx)}x^2\,dx = \begin{cases} -\frac{a^2xe^{\operatorname{asin}(a+bx)}}{5b^2}+\frac{a^2\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b^3}+\frac{ax^2e^{\operatorname{asin}(a+bx)}}{10b}-\frac{ax\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b^2}+\frac{3ae^{\operatorname{asin}(a+bx)}}{10b^3}+ 3 \\ \frac{x^3e^{\operatorname{asin}(a)}}{3} \end{cases}$$

```
[In] integrate(exp(asin(b*x+a))*x**2,x)
```

```
[Out] Piecewise((-a**2*x*exp(asin(a + b*x))/(5*b**2) + a**2*sqrt(-a**2 - 2*a*b*x
- b**2*x**2 + 1)*exp(asin(a + b*x))/(5*b**3) + a*x**2*exp(asin(a + b*x))/(1
0*b) - a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(5*b**2
) + 3*a*exp(asin(a + b*x))/(10*b**3) + 3*x**3*exp(asin(a + b*x))/10 + x**2*
sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(10*b) - x*exp(asi
n(a + b*x))/(10*b**2) + sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a +
b*x))/(10*b**3), Ne(b, 0)), (x**3*exp(asin(a))/3, True))
```

Maxima [F]

$$\int e^{\arcsin(a+bx)}x^2\,dx = \int x^2e^{(\arcsin(bx+a))}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="maxima")
```

```
[Out] integrate(x^2*e^(arcsin(b*x + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.01

$$\int e^{\arcsin(a+bx)}x^2\,dx = \frac{(bx+a)a^2e^{(\arcsin(bx+a))}}{2\,b^3} - \frac{2\,\sqrt{-(bx+a)^2+1}(bx+a)ae^{(\arcsin(bx+a))}}{5\,b^3} + \frac{\sqrt{-(bx+a)^2+1}a^2e^{(\arcsin(bx+a))}}{2\,b^3} + \frac{3\,\left((bx+a)^2-1\right)(bx+a)e^{(\arcsin(bx+a))}}{10\,b^3} - \frac{4\,\left((bx+a)^2-1\right)ae^{(\arcsin(bx+a))}}{5\,b^3} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}e^{(\arcsin(bx+a))}}{10\,b^3} + \frac{(bx+a)e^{(\arcsin(bx+a))}}{5\,b^3} - \frac{2\,ae^{(\arcsin(bx+a))}}{5\,b^3} + \frac{\sqrt{-(bx+a)^2+1}e^{(\arcsin(bx+a))}}{5\,b^3}$$

```
[In] integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="giac")
```

```
[Out] 1/2*(b*x + a)*a^2*e^(arcsin(b*x + a))/b^3 - 2/5*sqrt(-(b*x + a)^2 + 1)*(b*x
 + a)*a*e^(arcsin(b*x + a))/b^3 + 1/2*sqrt(-(b*x + a)^2 + 1)*a^2*e^(arcsin(
b*x + a))/b^3 + 3/10*((b*x + a)^2 - 1)*(b*x + a)*e^(arcsin(b*x + a))/b^3 -
4/5*((b*x + a)^2 - 1)*a*e^(arcsin(b*x + a))/b^3 - 1/10*(-(b*x + a)^2 + 1)^(
3/2)*e^(arcsin(b*x + a))/b^3 + 1/5*(b*x + a)*e^(arcsin(b*x + a))/b^3 - 2/5*
a*e^(arcsin(b*x + a))/b^3 + 1/5*sqrt(-(b*x + a)^2 + 1)*e^(arcsin(b*x + a))/
b^3
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x^2\,dx = \int x^2\,\mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

```
[In] int(x^2*exp(asin(a + b*x)),x)
```

```
[Out] int(x^2*exp(asin(a + b*x)), x)
```

3.453 $\int e^{\arcsin(a+bx)}x\,dx$

Optimal result

Integrand size = 10, antiderivative size = 101

$$\int e^{\arcsin(a+bx)}x\,dx = -\frac{ae^{\arcsin(a+bx)}(a+bx)}{2b^2} - \frac{ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^2} - \frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^2} + \frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^2}$$

```
[Out] -1/2*a*exp(arcsin(b*x+a))*(b*x+a)/b^2-1/5*exp(arcsin(b*x+a))*cos(2*arcsin(b
*x+a))/b^2+1/10*exp(arcsin(b*x+a))*sin(2*arcsin(b*x+a))/b^2-1/2*a*exp(arcsi
n(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^2
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {4920, 6873, 12, 6874, 4518, 4557, 4517}

$$\int e^{\arcsin(a+bx)}x\,dx = -\frac{a(a+bx)e^{\arcsin(a+bx)}}{2b^2} - \frac{a\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{2b^2} + \frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^2} - \frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^2}$$

```
[In] Int[E^ArcSin[a + b*x]*x,x]
```

```
[Out] -1/2*(a*E^ArcSin[a + b*x]*(a + b*x))/b^2 - (a*E^ArcSin[a + b*x]*Sqrt[1 - (a
 + b*x)^2])/(2*b^2) - (E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x]])/(5*b^2) +
(E^ArcSin[a + b*x]*Sin[2*ArcSin[a + b*x]])/(10*b^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4557

```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^x \cos(x) \left(-\frac{a}{b} + \frac{\sin(x)}{b}\right) \, dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)(-a+\sin(x))}{b} dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int e^x \cos(x)(-a+\sin(x)) dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{\text{Subst}\left(\int \left(-ae^x \cos(x) + e^x \cos(x)\sin(x)\right) dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= \frac{\text{Subst}\left(\int e^x \cos(x)\sin(x) dx, x, \arcsin(a+bx)\right)}{b^2} - \frac{a\text{Subst}\left(\int e^x \cos(x) dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= -\frac{ae^{\arcsin(a+bx)}(a+bx)}{2b^2} - \frac{ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^2} + \frac{\text{Subst}\left(\int \frac{1}{2}e^x \sin(2x) dx, x, \arcsin(a+bx)\right)}{b^2}$$

$$= -\frac{ae^{\arcsin(a+bx)}(a+bx)}{2b^2} - \frac{ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^2} + \frac{\text{Subst}\left(\int e^x \sin(2x) dx, x, \arcsin(a+bx)\right)}{2b^2}$$

$$= -\frac{ae^{\arcsin(a+bx)}(a+bx)}{2b^2} - \frac{ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^2} - \frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^2} + \frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^2}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.58

$$\int e^{\arcsin(a+bx)}x\,dx = -\frac{e^{\arcsin(a+bx)}\left(5a(a+bx)+(3a-2bx)\sqrt{1-(a+bx)^2}+2\cos(2\arcsin(a+bx))\right)}{10b^2}$$

```
[In] Integrate[E^ArcSin[a + b*x]*x,x]
```

```
[Out] -1/10*(E^ArcSin[a + b*x]*(5*a*(a + b*x) + (3*a - 2*b*x)*Sqrt[1 - (a + b*x)^
2] + 2*Cos[2*ArcSin[a + b*x]]))/b^2
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)}x dx$$

```
[In] int(exp(arcsin(b*x+a))*x,x)
```

```
[Out] int(exp(arcsin(b*x+a))*x,x)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.62

$$\int e^{\arcsin(a+bx)}x\,dx = \frac{\left(4\,b^2x^2+3\,abx-a^2+\sqrt{-b^2x^2-2\,abx-a^2+1}(2\,bx-3\,a)-2\right)e^{(\arcsin(bx+a))}}{10\,b^2}$$

```
[In] integrate(exp(arcsin(b*x+a))*x,x, algorithm="fricas")
```

```
[Out] 1/10*(4*b^2*x^2 + 3*a*b*x - a^2 + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*b*x
 - 3*a) - 2)*e^(arcsin(b*x + a))/b^2
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.45

$$\int e^{\arcsin(a+bx)}x\,dx = \begin{cases} -\frac{a^2e^{\operatorname{asin}(a+bx)}}{10b^2}+\frac{3axe^{\operatorname{asin}(a+bx)}}{10b}-\frac{3a\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{10b^2}+\frac{2x^2e^{\operatorname{asin}(a+bx)}}{5}+\frac{x\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b}- \\ \frac{x^2e^{\operatorname{asin}(a)}}{2} \end{cases}$$

```
[In] integrate(exp(asin(b*x+a))*x,x)
```

```
[Out] Piecewise((-a**2*exp(asin(a + b*x))/(10*b**2) + 3*a*x*exp(asin(a + b*x))/(1
0*b) - 3*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(10*b**
2) + 2*x**2*exp(asin(a + b*x))/5 + x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*
exp(asin(a + b*x))/(5*b) - exp(asin(a + b*x))/(5*b**2), Ne(b, 0)), (x**2*ex
p(asin(a))/2, True))
```

Maxima [F]

$$\int e^{\arcsin(a+bx)}x\,dx = \int xe^{(\arcsin(bx+a))}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))*x,x, algorithm="maxima")
[Out] integrate(x*e^(arcsin(b*x + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.07

$$\int e^{\arcsin(a+bx)}x\,dx = -\frac{(bx+a)ae^{(\arcsin(bx+a))}}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)e^{(\arcsin(bx+a))}}{5\,b^2} - \frac{\sqrt{-(bx+a)^2+1}ae^{(\arcsin(bx+a))}}{2\,b^2} + \frac{2\left((bx+a)^2-1\right)e^{(\arcsin(bx+a))}}{5\,b^2} + \frac{e^{(\arcsin(bx+a))}}{5\,b^2}$$

```
[In] integrate(exp(arcsin(b*x+a))*x,x, algorithm="giac")
[Out] -1/2*(b*x + a)*a*e^(arcsin(b*x + a))/b^2 + 1/5*sqrt(-(b*x + a)^2 + 1)*(b*x
+ a)*e^(arcsin(b*x + a))/b^2 - 1/2*sqrt(-(b*x + a)^2 + 1)*a*e^(arcsin(b*x +
 a))/b^2 + 2/5*((b*x + a)^2 - 1)*e^(arcsin(b*x + a))/b^2 + 1/5*e^(arcsin(b*
x + a))/b^2
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x\,dx = \int x\,\mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

```
[In] int(x*exp(asin(a + b*x)),x)
[Out] int(x*exp(asin(a + b*x)), x)
```

3.454 $\int e^{\arcsin(a+bx)}\,dx$

Optimal result

Integrand size = 8, antiderivative size = 51

$$\int e^{\arcsin(a+bx)}\,dx=\frac{e^{\arcsin(a+bx)}(a+bx)}{2b}+\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b}$$

```
[Out] 1/2*exp(arcsin(b*x+a))*(b*x+a)/b+1/2*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)
/b
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4920, 4518}

$$\int e^{\arcsin(a+bx)}\,dx=\frac{(a+bx)e^{\arcsin(a+bx)}}{2b}+\frac{\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{2b}$$

```
[In] Int[E^ArcSin[a + b*x],x]
```

```
[Out] (E^ArcSin[a + b*x]*(a + b*x))/(2*b) + (E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)
^2])/(2*b)
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int e^x \cos(x)\, dx, x, \arcsin(a+bx)\right)}{b} \\ &= \frac{e^{\arcsin(a+bx)}(a+bx)}{2b} + \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.69

$$\int e^{\arcsin(a+bx)}\, dx = \frac{e^{\arcsin(a+bx)}\left(a+bx+\sqrt{1-(a+bx)^2}\right)}{2b}$$

```
[In] Integrate[E^ArcSin[a + b*x],x]
[Out] (E^ArcSin[a + b*x]*(a + b*x + Sqrt[1 - (a + b*x)^2]))/(2*b)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)} dx$$

```
[In] int(exp(arcsin(b*x+a)),x)
[Out] int(exp(arcsin(b*x+a)),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.76

$$\int e^{\arcsin(a+bx)}\, dx = \frac{\left(bx+a+\sqrt{-b^2x^2-2\,abx-a^2+1}\right)e^{(\arcsin(bx+a))}}{2\,b}$$

```
[In] integrate(exp(arcsin(b*x+a)),x, algorithm="fricas")
[Out] 1/2*(b*x + a + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))*e^(arcsin(b*x + a))/b
```

Sympy [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.27

$$\int e^{\arcsin(a+bx)}\,dx = \begin{cases} \frac{ae^{\operatorname{asin}(a+bx)}}{2b} + \frac{xe^{\operatorname{asin}(a+bx)}}{2} + \frac{\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{2b} & \text{for } b \neq 0 \\ xe^{\operatorname{asin}(a)} & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(b*x+a)),x)
```

```
[Out] Piecewise((a*exp(asin(a + b*x))/(2*b) + x*exp(asin(a + b*x))/2 + sqrt(-a**2
 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(2*b), Ne(b, 0)), (x*exp(asi
n(a)), True))
```

Maxima [F]

$$\int e^{\arcsin(a+bx)}\,dx = \int e^{(\arcsin(bx+a))}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)),x, algorithm="maxima")
```

```
[Out] integrate(e^(arcsin(b*x + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.84

$$\int e^{\arcsin(a+bx)}\,dx = \frac{(bx+a)e^{(\arcsin(bx+a))}}{2\,b} + \frac{\sqrt{-(bx+a)^2+1}e^{(\arcsin(bx+a))}}{2\,b}$$

```
[In] integrate(exp(arcsin(b*x+a)),x, algorithm="giac")
```

```
[Out] 1/2*(b*x + a)*e^(arcsin(b*x + a))/b + 1/2*sqrt(-(b*x + a)^2 + 1)*e^(arcsin(
b*x + a))/b
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}\,dx = \int \mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

```
[In] int(exp(asin(a + b*x)),x)
[Out] int(exp(asin(a + b*x)), x)
```

3.455 $\int \frac{e^{\arcsin(a+bx)}}{x}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = b\text{Int}\left(\frac{e^{\arcsin(a+bx)}}{bx},x\right)$$

```
[Out] b*CannotIntegrate(exp(arcsin(b*x+a))/b/x,x)
```

Rubi [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = \int \frac{e^{\arcsin(a+bx)}}{x}\,dx$$

```
[In] Int[E^ArcSin[a + b*x]/x,x]
[Out] Defer[Subst][Defer[Int][(E^x*Cos[x])/(-a + Sin[x]), x], x, ArcSin[a + b*x]]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx,x,\arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{be^x\cos(x)}{-a+\sin(x)}\,dx,x,\arcsin(a+bx)\right)}{b}\\
&= \text{Subst}\left(\int \frac{e^x\cos(x)}{-a+\sin(x)}\,dx,x,\arcsin(a+bx)\right)
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx=\int \frac{e^{\arcsin(a+bx)}}{x}\,dx$$

```
[In] Integrate[E^ArcSin[a + b*x]/x,x]
[Out] Integrate[E^ArcSin[a + b*x]/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)}}{x}dx$$

```
[In] int(exp(arcsin(b*x+a))/x,x)
[Out] int(exp(arcsin(b*x+a))/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx=\int \frac{e^{(\arcsin(bx+a))}}{x}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x,x, algorithm="fricas")
[Out] integral(e^(arcsin(b*x + a))/x, x)
```

Sympy [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx=\int \frac{e^{\operatorname{asin}(a+bx)}}{x}\,dx$$

```
[In] integrate(exp(asin(b*x+a))/x,x)
[Out] Integral(exp(asin(a + b*x))/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{(\arcsin(bx+a))}}{x} \, dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x,x, algorithm="maxima")
[Out] integrate(e^(arcsin(b*x + a))/x, x)
```

Giac [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{(\arcsin(bx+a))}}{x} \, dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x,x, algorithm="giac")
[Out] integrate(e^(arcsin(b*x + a))/x, x)
```

Mupad [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{\mathrm{asin}(a+b\,x)}}{x} \, dx$$

```
[In] int(exp(asin(a + b*x))/x,x)
[Out] int(exp(asin(a + b*x))/x, x)
```

3.456 $\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = b^2\mathrm{Int}\left(\frac{e^{\arcsin(a+bx)}}{b^2x^2},x\right)$$

```
[Out] b^2*CannotIntegrate(exp(arcsin(b*x+a))/b^2/x^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx$$

```
[In] Int[E^ArcSin[a + b*x]/x^2,x]
[Out] b*Defer[Subst][Defer[Int][(E^x*Cos[x])/(a - Sin[x])^2, x], x, ArcSin[a + b*
x]]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2}\,dx,x,\arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \frac{b^2e^x\cos(x)}{(a-\sin(x))^2}\,dx,x,\arcsin(a+bx)\right)}{b}\\
&= b\text{Subst}\left(\int \frac{e^x\cos(x)}{(a-\sin(x))^2}\,dx,x,\arcsin(a+bx)\right)
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} \, dx = \int \frac{e^{\arcsin(a+bx)}}{x^2} \, dx$$

```
[In] Integrate[E^ArcSin[a + b*x]/x^2,x]
[Out] Integrate[E^ArcSin[a + b*x]/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)}}{x^2} dx$$

```
[In] int(exp(arcsin(b*x+a))/x^2,x)
[Out] int(exp(arcsin(b*x+a))/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} \, dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="fricas")
[Out] integral(e^(arcsin(b*x + a))/x^2, x)
```

Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} \, dx = \int \frac{e^{\operatorname{asin}(a+bx)}}{x^2} \, dx$$

```
[In] integrate(exp(asin(b*x+a))/x**2,x)
[Out] Integral(exp(asin(a + b*x))/x**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="maxima")
[Out] integrate(e^(arcsin(b*x + a))/x^2, x)
```

Giac [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="giac")
[Out] integrate(e^(arcsin(b*x + a))/x^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a+b\,x)}}{x^2}\,dx$$

```
[In] int(exp(asin(a + b*x))/x^2,x)
[Out] int(exp(asin(a + b*x))/x^2, x)
```

3.457 $\int e^{\arcsin(a+bx)^2} x^3 \, dx$

Optimal result

Integrand size = 14, antiderivative size = 381

$$\begin{aligned}\int e^{\arcsin(a+bx)^2} x^3 \, dx = {} & \frac{e\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{16b^4} + \frac{3a^2e\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{8b^4} \\ & - \frac{e^4\sqrt{\pi}\text{erf}(2-i\arcsin(a+bx))}{32b^4} + \frac{e\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{16b^4} \\ & + \frac{3a^2e\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{8b^4} - \frac{e^4\sqrt{\pi}\text{erf}(2+i\arcsin(a+bx))}{32b^4} \\ & - \frac{3a\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^4} \\ & - \frac{a^3\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^4} \\ & - \frac{3a\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^4} \\ & - \frac{a^3\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^4} \\ & + \frac{3ae^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^4} \\ & + \frac{3ae^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^4}\end{aligned}$$

```
[Out] 1/16*I*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^4+3/8*I*a^2*exp(1)*erfi(-I+
arcsin(b*x+a))*Pi^(1/2)/b^4-1/16*I*exp(1)*erfi(I+arcsin(b*x+a))*Pi^(1/2)/b^
4-3/8*I*a^2*exp(1)*erfi(I+arcsin(b*x+a))*Pi^(1/2)/b^4-1/32*I*exp(4)*erfi(-2
*I+arcsin(b*x+a))*Pi^(1/2)/b^4+1/32*I*exp(4)*erfi(2*I+arcsin(b*x+a))*Pi^(1/
2)/b^4-3/16*a*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4-1/4*a^3*exp(
1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4-3/16*a*exp(1/4)*erfi(1/2*I+arc
sin(b*x+a))*Pi^(1/2)/b^4-1/4*a^3*exp(1/4)*erfi(1/2*I+arcsin(b*x+a))*Pi^(1/2
```

```
)/b^4+3/16*a*exp(9/4)*erfi(-3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4+3/16*a*exp(9/
4)*erfi(3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4920, 6873, 12, 6874, 4561, 2266, 2235, 4562}

$$\begin{aligned}\int e^{\arcsin(a+bx)^2}x^3\,dx= & -\frac{\sqrt[4]{e}\sqrt{\pi}a^3\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{4b^4} \\ & -\frac{\sqrt[4]{e}\sqrt{\pi}a^3\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{4b^4} \\ & +\frac{3e\sqrt{\pi}a^2\text{erf}(1-i\arcsin(a+bx))}{8b^4}+\frac{3e\sqrt{\pi}a^2\text{erf}(1+i\arcsin(a+bx))}{8b^4} \\ & +\frac{e\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{16b^4}-\frac{e^4\sqrt{\pi}\text{erf}(2-i\arcsin(a+bx))}{32b^4} \\ & +\frac{e\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{16b^4}-\frac{e^4\sqrt{\pi}\text{erf}(2+i\arcsin(a+bx))}{32b^4} \\ & -\frac{3\sqrt[4]{e}\sqrt{\pi}a\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{16b^4} \\ & -\frac{3\sqrt[4]{e}\sqrt{\pi}a\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{16b^4} \\ & +\frac{3e^{9/4}\sqrt{\pi}a\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-3i)\right)}{16b^4} \\ & +\frac{3e^{9/4}\sqrt{\pi}a\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+3i)\right)}{16b^4}\end{aligned}$$

```
[In] Int[E^ArcSin[a + b*x]^2*x^3,x]
```

```
[Out] (E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]])/(16*b^4) + (3*a^2*E*Sqrt[Pi]*Erf[1
- I*ArcSin[a + b*x]])/(8*b^4) - (E^4*Sqrt[Pi]*Erf[2 - I*ArcSin[a + b*x]])/(
32*b^4) + (E*Sqrt[Pi]*Erf[1 + I*ArcSin[a + b*x]])/(16*b^4) + (3*a^2*E*Sqrt[
Pi]*Erf[1 + I*ArcSin[a + b*x]])/(8*b^4) - (E^4*Sqrt[Pi]*Erf[2 + I*ArcSin[a
+ b*x]])/(32*b^4) - (3*a*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])
/(16*b^4) - (a^3*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/(4*b^4)
 - (3*a*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(16*b^4) - (a^3*E
^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(4*b^4) + (3*a*E^(9/4)*Sqr
t[Pi]*Erfi[(-3*I + 2*ArcSin[a + b*x])/2])/(16*b^4) + (3*a*E^(9/4)*Sqrt[Pi]*
Erfi[(3*I + 2*ArcSin[a + b*x])/2])/(16*b^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4561

```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^3\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)(-a+\sin(x))^3}{b^3}\,dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)(-a+\sin(x))^3\,dx, x, \arcsin(a+bx)\right)}{b^4}$$

$$= \frac{\text{Subst}\left(\int \left(-a^3e^{x^2}\cos(x)+3a^2e^{x^2}\cos(x)\sin(x)-3ae^{x^2}\cos(x)\sin^2(x)+e^{x^2}\cos(x)\sin^3(x)\right)\,dx, x, a}{b^4}$$

$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin^3(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} - \frac{(3a)\text{Subst}\left(\int e^{x^2}\cos(x)\sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} + \frac{(3a^2)\,\text{Subst}\left(\int e^{x^2}\cos(x)\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^4} - \frac{a^3\text{Subst}\left(\int e^{x^2}\cos(x)\,dx, x, \arcsin(a+bx)\right)}{b^4}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{8}ie^{-2ix+x^2}-\frac{1}{8}ie^{2ix+x^2}-\frac{1}{16}ie^{-4ix+x^2}+\frac{1}{16}ie^{4ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^4} - \frac{(3a)\text{Subst}\left(\int \left(\frac{1}{8}e^{-ix+x^2}+\frac{1}{8}e^{ix+x^2}-\frac{1}{8}e^{-3ix+x^2}-\frac{1}{8}e^{3ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^4} + \frac{(3a^2)\,\text{Subst}\left(\int \left(\frac{1}{4}ie^{-2ix+x^2}-\frac{1}{4}ie^{2ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^4} - \frac{a^3\text{Subst}\left(\int \left(\frac{1}{2}e^{-ix+x^2}+\frac{1}{2}e^{ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^4}$$

$$= -\frac{i\text{Subst}\left(\int e^{-4ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{16b^4} + \frac{i\text{Subst}\left(\int e^{4ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{16b^4} + \frac{i\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{i\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{(3a)\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{(3a)\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} + \frac{(3a)\text{Subst}\left(\int e^{-3ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} + \frac{(3a)\text{Subst}\left(\int e^{3ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} + \frac{(3ia^2)\,\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{4b^4} - \frac{(3ia^2)\,\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{4b^4} - \frac{a^3\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^4} - \frac{a^3\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^4}$$

$$= -\frac{\left(3a\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{\left(3a\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{\left(a^3\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^4} - \frac{\left(a^3\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^4} + \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} + \frac{(3ia^2e)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{4b^4} - \frac{(3ia^2e)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{4b^4} + \frac{\left(3ae^{9/4}\right)\text{Subst}\left(\int e^{\frac{1}{4}(-3i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} + \frac{\left(3ae^{9/4}\right)\text{Subst}\left(\int e^{\frac{1}{4}(3i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^4} - \frac{\left(ie^4\right)\text{Subst}\left(\int e^{\frac{1}{4}(-4i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{16b^4} + \frac{\left(ie^4\right)\text{Subst}\left(\int e^{\frac{1}{4}(4i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{16b^4}$$

$$
\begin{aligned}
&= \frac{e\sqrt{\pi}\mathrm{erf}(1-i\arcsin(a+bx))}{16b^4} + \frac{3a^2e\sqrt{\pi}\mathrm{erf}(1-i\arcsin(a+bx))}{8b^4} \\
&\quad - \frac{e^4\sqrt{\pi}\mathrm{erf}(2-i\arcsin(a+bx))}{32b^4} + \frac{e\sqrt{\pi}\mathrm{erf}(1+i\arcsin(a+bx))}{16b^4} \\
&\quad + \frac{3a^2e\sqrt{\pi}\mathrm{erf}(1+i\arcsin(a+bx))}{8b^4} - \frac{e^4\sqrt{\pi}\mathrm{erf}(2+i\arcsin(a+bx))}{32b^4} \\
&\quad - \frac{3a\sqrt[4]{e}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^4} \\
&\quad - \frac{a^3\sqrt[4]{e}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^4} \\
&\quad - \frac{3a\sqrt[4]{e}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^4} - \frac{a^3\sqrt[4]{e}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^4} \\
&\quad + \frac{3ae^{9/4}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^4} \\
&\quad + \frac{3ae^{9/4}\sqrt{\pi}\mathrm{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.58

$$
\int e^{\arcsin(a+bx)^2}x^3\,dx = -\frac{\sqrt{\pi}\left(-2(e+6a^2e)\,\mathrm{erf}(1-i\arcsin(a+bx)) + e^4\mathrm{erf}(2-i\arcsin(a+bx)) + \sqrt[4]{e}\left(-2ia(3+4a^2)\,\mathrm{erf}\left(\frac{1}{2}+i\right.\right.\right.}{}
$$

```
[In] Integrate[E^ArcSin[a + b*x]^2*x^3,x]
```

```
[Out] -1/32*(Sqrt[Pi]*(-2*(E + 6*a^2*E)*Erf[1 - I*ArcSin[a + b*x]] + E^4*Erf[2 -
I*ArcSin[a + b*x]] + E^(1/4)*((-2*I)*a*(3 + 4*a^2)*Erf[1/2 + I*ArcSin[a + b
*x]] - 2*(1 + 6*a^2)*E^(3/4)*Erf[1 + I*ArcSin[a + b*x]] + (6*I)*a*E^2*Erf[3
/2 + I*ArcSin[a + b*x]] + E^(15/4)*Erf[2 + I*ArcSin[a + b*x]] + 6*a*Erfi[(I
 + 2*ArcSin[a + b*x])/2] + 8*a^3*Erfi[(I + 2*ArcSin[a + b*x])/2] - 6*a*E^2*
Erfi[(3*I + 2*ArcSin[a + b*x])/2])))/b^4
```

Maple [F]

$$
\int \mathrm{e}^{\arcsin(bx+a)^2}x^3dx
$$

```
[In] int(exp(arcsin(b*x+a)^2)*x^3,x)
```

```
[Out] int(exp(arcsin(b*x+a)^2)*x^3,x)
```

Fricas [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx = \int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="fricas")

[Out] integral(x^3*e^(arcsin(b*x + a)^2), x)

Sympy [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx = \int x^3e^{\operatorname{asin}^2(a+bx)}\,dx$$

[In] integrate(exp(asin(b*x+a)**2)*x**3,x)

[Out] Integral(x**3*exp(asin(a + b*x)**2), x)

Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx = \int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="maxima")

[Out] integrate(x^3*e^(arcsin(b*x + a)^2), x)

Giac [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx = \int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="giac")

[Out] integrate(x^3*e^(arcsin(b*x + a)^2), x)

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3\,\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

```
[In] int(x^3*exp(asin(a + b*x)^2),x)
[Out] int(x^3*exp(asin(a + b*x)^2), x)
```

3.458 $\int e^{\arcsin(a+bx)^2}x^2\,dx$

Optimal result

Integrand size = 14, antiderivative size = 265

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = -\frac{ae\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{4b^3} - \frac{ae\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^3} + \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^3} + \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^3}$$

```
[Out] -1/4*I*a*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/4*I*a*exp(1)*erfi(I+a
rcsin(b*x+a))*Pi^(1/2)/b^3+1/16*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2
)/b^3+1/4*a^2*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/16*exp(1/4
)*erfi(1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/4*a^2*exp(1/4)*erfi(1/2*I+arcsin
(b*x+a))*Pi^(1/2)/b^3-1/16*exp(9/4)*erfi(-3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3
-1/16*exp(9/4)*erfi(3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4920, 6873, 12, 6874, 4561, 2266, 2235, 4562}

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}a^2\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}a^2\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{4b^3} - \frac{e\sqrt{\pi}a\text{erf}(1-i\arcsin(a+bx))}{4b^3} - \frac{e\sqrt{\pi}a\text{erf}(1+i\arcsin(a+bx))}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{16b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{16b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-3i)\right)}{16b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+3i)\right)}{16b^3}$$

```
[In] Int[E^ArcSin[a + b*x]^2*x^2,x]
```

```
[Out] -1/4*(a*E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]])/b^3 - (a*E*Sqrt[Pi]*Erf[1 +
I*ArcSin[a + b*x]])/(4*b^3) + (E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x
])/2])/(16*b^3) + (a^2*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/(
4*b^3) + (E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(16*b^3) + (a^2
*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(4*b^3) - (E^(9/4)*Sqrt[
Pi]*Erfi[(-3*I + 2*ArcSin[a + b*x])/2])/(16*b^3) - (E^(9/4)*Sqrt[Pi]*Erfi[(
3*I + 2*ArcSin[a + b*x])/2])/(16*b^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4561

```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2 dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)(a-\sin(x))^2}{b^2} dx, x, \arcsin(a+bx)\right)}{b}$$

$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)(a-\sin(x))^2 dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$= \frac{\text{Subst}\left(\int \left(a^2e^{x^2}\cos(x)-2ae^{x^2}\cos(x)\sin(x)+e^{x^2}\cos(x)\sin^2(x)\right) dx, x, \arcsin(a+bx)\right)}{b^3}$$

$$
\begin{aligned}
&= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin^2(x)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad - \frac{(2a)\text{Subst}\left(\int e^{x^2}\cos(x)\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad + \frac{a^2\text{Subst}\left(\int e^{x^2}\cos(x)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{8}e^{-ix+x^2}+\frac{1}{8}e^{ix+x^2}-\frac{1}{8}e^{-3ix+x^2}-\frac{1}{8}e^{3ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad - \frac{(2a)\text{Subst}\left(\int \left(\frac{1}{4}ie^{-2ix+x^2}-\frac{1}{4}ie^{2ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&\quad + \frac{a^2\text{Subst}\left(\int \left(\frac{1}{2}e^{-ix+x^2}+\frac{1}{2}e^{ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^3} \\
&= \frac{\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3}+\frac{\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3} \\
&\quad - \frac{\text{Subst}\left(\int e^{-3ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3}-\frac{\text{Subst}\left(\int e^{3ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3} \\
&\quad - \frac{(ia)\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3}+\frac{(ia)\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3} \\
&\quad + \frac{a^2\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3}+\frac{a^2\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3}
\end{aligned}
$$

$$= \frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3} + \frac{\sqrt[4]{e}\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3} + \frac{\left(a^2\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3} + \frac{\left(a^2\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3} - \frac{(iae)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3} + \frac{(iae)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^3} - \frac{e^{9/4}\text{Subst}\left(\int e^{\frac{1}{4}(-3i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3} - \frac{e^{9/4}\text{Subst}\left(\int e^{\frac{1}{4}(3i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{8b^3}$$

$$= -\frac{ae\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{4b^3} - \frac{ae\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^3} + \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^3} + \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^3} + \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^3} - \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^3}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.61

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = -\frac{\sqrt{\pi}\left(4ae\text{erf}(1-i\arcsin(a+bx)) + i\sqrt[4]{e}\left(-\left((1+4a^2)\,\text{erf}\left(\frac{1}{2}-i\arcsin(a+bx)\right)\right) + e^2\text{erf}\left(\frac{3}{2}-i\arcsin(a+\right.\right.\right.}{}$$

```
[In] Integrate[E^ArcSin[a + b*x]^2*x^2,x]
```

```
[Out] -1/16*(Sqrt[Pi]*(4*a*E*Erf[1 - I*ArcSin[a + b*x]] + I*E^(1/4)*(-((1 + 4*a^2
)*Erf[1/2 - I*ArcSin[a + b*x]]) + E^2*Erf[3/2 - I*ArcSin[a + b*x]] + Erf[1/
2 + I*ArcSin[a + b*x]] + 4*a^2*Erf[1/2 + I*ArcSin[a + b*x]] - (4*I)*a*E^(3/
4)*Erf[1 + I*ArcSin[a + b*x]] - E^2*Erf[3/2 + I*ArcSin[a + b*x]])))/b^3
```

Maple [F]

$$\int e^{\arcsin(bx+a)^2}x^2dx$$

[In] int(exp(arcsin(b*x+a)^2)*x^2,x)

[Out] int(exp(arcsin(b*x+a)^2)*x^2,x)

Fricas [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \int x^2e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="fricas")

[Out] integral(x^2*e^(arcsin(b*x + a)^2), x)

Sympy [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \int x^2e^{\operatorname{asin}^2(a+bx)}\,dx$$

[In] integrate(exp(asin(b*x+a)**2)*x**2,x)

[Out] Integral(x**2*exp(asin(a + b*x)**2), x)

Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \int x^2e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="maxima")

[Out] integrate(x^2*e^(arcsin(b*x + a)^2), x)

Giac [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \int x^2e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="giac")
[Out] integrate(x^2*e^(arcsin(b*x + a)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x^2\,dx = \int x^2\,e^{\mathrm{asin}(a+b\,x)^2}\,dx$$

```
[In] int(x^2*exp(asin(a + b*x)^2),x)
[Out] int(x^2*exp(asin(a + b*x)^2), x)
```

3.459 $\int e^{\arcsin(a+bx)^2}x\,dx$

Optimal result

Integrand size = 12, antiderivative size = 123

$$\int e^{\arcsin(a+bx)^2}x\,dx=\frac{e\sqrt{\pi}\operatorname{erf}(1-i\arcsin(a+bx))}{8b^2}+\frac{e\sqrt{\pi}\operatorname{erf}(1+i\arcsin(a+bx))}{8b^2}-\frac{a\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^2}-\frac{a\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^2}$$

```
[Out] 1/8*I*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^2-1/8*I*exp(1)*erfi(I+arcsin
(b*x+a))*Pi^(1/2)/b^2-1/4*a*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^
2-1/4*a*exp(1/4)*erfi(1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4920, 6873, 12, 6874, 4561, 2266, 2235, 4562}

$$\int e^{\arcsin(a+bx)^2}x\,dx=\frac{e\sqrt{\pi}\operatorname{erf}(1-i\arcsin(a+bx))}{8b^2}+\frac{e\sqrt{\pi}\operatorname{erf}(1+i\arcsin(a+bx))}{8b^2}-\frac{\sqrt[4]{e}\sqrt{\pi}a\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{4b^2}-\frac{\sqrt[4]{e}\sqrt{\pi}a\operatorname{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{4b^2}$$

```
[In] Int[E^ArcSin[a + b*x]^2*x,x]
```

```
[Out] (E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]])/(8*b^2) + (E*Sqrt[Pi]*Erf[1 + I*Arc
Sin[a + b*x]])/(8*b^2) - (a*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/
2])/(4*b^2) - (a*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(4*b^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4561

```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

Rule 4562

```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)\,dx, x, \arcsin(a+bx)\right)}{b}$$
$$= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)(-a+\sin(x))}{b}\,dx, x, \arcsin(a+bx)\right)}{b}$$
$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)(-a+\sin(x))\,dx, x, \arcsin(a+bx)\right)}{b^2}$$
$$= \frac{\text{Subst}\left(\int \left(-ae^{x^2}\cos(x)+e^{x^2}\cos(x)\sin(x)\right)\,dx, x, \arcsin(a+bx)\right)}{b^2}$$
$$= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\sin(x)\,dx, x, \arcsin(a+bx)\right)}{b^2} - \frac{a\text{Subst}\left(\int e^{x^2}\cos(x)\,dx, x, \arcsin(a+bx)\right)}{b^2}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{4}ie^{-2ix+x^2}-\frac{1}{4}ie^{2ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^2} - \frac{a\text{Subst}\left(\int \left(\frac{1}{2}e^{-ix+x^2}+\frac{1}{2}e^{ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b^2}$$
$$= \frac{i\text{Subst}\left(\int e^{-2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{4b^2} - \frac{i\text{Subst}\left(\int e^{2ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{4b^2} - \frac{a\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^2} - \frac{a\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b^2}$$
$$= -\frac{\left(a\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^2} - \frac{\left(a\sqrt[4]{e}\right)\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b^2} + \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(-2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{4b^2} - \frac{(ie)\text{Subst}\left(\int e^{\frac{1}{4}(2i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{4b^2}$$
$$= \frac{e\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{8b^2} + \frac{e\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{8b^2} - \frac{a\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^2} - \frac{a\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^2}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.76

$$\int e^{\arcsin(a+bx)^2}x\,dx$$
$$= \frac{\sqrt{\pi}\big(e\text{erf}(1-i\arcsin(a+bx))+e\text{erf}(1+i\arcsin(a+bx))-2a\sqrt[4]{e}\text{erfi}\big(\frac{1}{2}(-i+2\arcsin(a+bx))\big)-2a\sqrt[4]{e}e}{8b^2}$$

```
[In] Integrate[E^ArcSin[a + b*x]^2*x,x]
```

```
[Out] (Sqrt[Pi]*(E*Erf[1 - I*ArcSin[a + b*x]] + E*Erf[1 + I*ArcSin[a + b*x]] - 2*
a*E^(1/4)*Erfi[(-I + 2*ArcSin[a + b*x])/2] - 2*a*E^(1/4)*Erfi[(I + 2*ArcSin
[a + b*x])/2]))/(8*b^2)
```

Maple [F]

$$\int e^{\arcsin(bx+a)^2}xdx$$

```
[In] int(exp(arcsin(b*x+a)^2)*x,x)
```

```
[Out] int(exp(arcsin(b*x+a)^2)*x,x)
```

Fricas [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx = \int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="fricas")
```

```
[Out] integral(x*e^(arcsin(b*x + a)^2), x)
```

Sympy [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx = \int xe^{\operatorname{asin}^2(a+bx)}\,dx$$

```
[In] integrate(exp(asin(b*x+a)**2)*x,x)
```

```
[Out] Integral(x*exp(asin(a + b*x)**2), x)
```

Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="maxima")
[Out] integrate(x*e^(arcsin(b*x + a)^2), x)
```

Giac [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="giac")
[Out] integrate(x*e^(arcsin(b*x + a)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int x\,\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

```
[In] int(x*exp(asin(a + b*x)^2),x)
[Out] int(x*exp(asin(a + b*x)^2), x)
```

3.460 $\int e^{\arcsin(a+bx)^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 69

$$\int e^{\arcsin(a+bx)^2}\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b}$$

```
[Out] 1/4*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b+1/4*exp(1/4)*erfi(1/2*I+
arcsin(b*x+a))*Pi^(1/2)/b
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4920, 4561, 2266, 2235}

$$\int e^{\arcsin(a+bx)^2}\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)}{4b}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{4b}$$

```
[In] Int[E^ArcSin[a + b*x]^2,x]
```

```
[Out] (E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/(4*b) + (E^(1/4)*Sqrt[P
i]*Erfi[(I + 2*ArcSin[a + b*x])/2])/(4*b)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 4561

```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^{x^2}\cos(x)\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2}e^{-ix+x^2}+\frac{1}{2}e^{ix+x^2}\right)\,dx, x, \arcsin(a+bx)\right)}{b}\\
&= \frac{\text{Subst}\left(\int e^{-ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b}+\frac{\text{Subst}\left(\int e^{ix+x^2}\,dx, x, \arcsin(a+bx)\right)}{2b}\\
&= \frac{\sqrt[4]{e}\,\text{Subst}\left(\int e^{\frac{1}{4}(-i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b}+\frac{\sqrt[4]{e}\,\text{Subst}\left(\int e^{\frac{1}{4}(i+2x)^2}\,dx, x, \arcsin(a+bx)\right)}{2b}\\
&= \frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.75

$$\int e^{\arcsin(a+bx)^2}\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\left(\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)+\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)\right)}{4b}$$

```
[In] Integrate[E^ArcSin[a + b*x]^2,x]
[Out] (E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a + b*x])/2] + Erfi[(I + 2*ArcSin[a
+ b*x])/2]))/(4*b)
```

Maple [F]

$$\int e^{\arcsin(bx+a)^2}dx$$

[In] int(exp(arcsin(b*x+a)^2),x)

[Out] int(exp(arcsin(b*x+a)^2),x)

Fricas [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2),x, algorithm="fricas")

[Out] integral(e^(arcsin(b*x + a)^2), x)

Sympy [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\operatorname{asin}^2(a+bx)}\,dx$$

[In] integrate(exp(asin(b*x+a)**2),x)

[Out] Integral(exp(asin(a + b*x)**2), x)

Maxima [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

[In] integrate(exp(arcsin(b*x+a)^2),x, algorithm="maxima")

[Out] integrate(e^(arcsin(b*x + a)^2), x)

Giac [F]

$$\int e^{\arcsin(a+bx)^2} dx = \int e^{\left(\arcsin(bx+a)^2\right)} dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2),x, algorithm="giac")
[Out] integrate(e^(arcsin(b*x + a)^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2} dx = \int e^{\operatorname{asin}(a+b\,x)^2} dx$$

```
[In] int(exp(asin(a + b*x)^2),x)
[Out] int(exp(asin(a + b*x)^2), x)
```

3.461 $\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx$

Optimal result

Integrand size = 14, antiderivative size = 14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = b\mathrm{Int}\left(\frac{e^{\arcsin(a+bx)^2}}{bx},x\right)$$

```
[Out] b*CannotIntegrate(exp(arcsin(b*x+a)^2)/b/x,x)
```

Rubi [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx$$

```
[In] Int[E^ArcSin[a + b*x]^2/x,x]
```

```
[Out] Defer[Subst][Defer[Int][(E^x^2*Cos[x])/(-a + Sin[x]), x], x, ArcSin[a + b*x
]]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)}{-\frac{a}{b}+\frac{\sin(x)}{b}}\,dx,x,\arcsin(a+bx)\right)}{b} \\
&= \frac{\text{Subst}\left(\int \frac{be^{x^2}\cos(x)}{-a+\sin(x)}\,dx,x,\arcsin(a+bx)\right)}{b} \\
&= \text{Subst}\left(\int \frac{e^{x^2}\cos(x)}{-a+\sin(x)}\,dx,x,\arcsin(a+bx)\right)
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx$$

```
[In] Integrate[E^ArcSin[a + b*x]^2/x,x]
[Out] Integrate[E^ArcSin[a + b*x]^2/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.93

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)^2}}{x}dx$$

```
[In] int(exp(arcsin(b*x+a)^2)/x,x)
[Out] int(exp(arcsin(b*x+a)^2)/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="fricas")
[Out] integral(e^(arcsin(b*x + a)^2)/x, x)
```

Sympy [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.86

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\operatorname{asin}^2(a+bx)}}{x}\,dx$$

```
[In] integrate(exp(asin(b*x+a)**2)/x,x)
[Out] Integral(exp(asin(a + b*x)**2)/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="maxima")
[Out] integrate(e^(arcsin(b*x + a)^2)/x, x)
```

Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="giac")
[Out] integrate(e^(arcsin(b*x + a)^2)/x, x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}}{x}\,dx$$

```
[In] int(exp(asin(a + b*x)^2)/x,x)
[Out] int(exp(asin(a + b*x)^2)/x, x)
```

3.462 $\int \frac{e^{\arcsin(a+bx)^2}}{x^2} dx$

Optimal result

Integrand size = 14, antiderivative size = 14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} dx = b^2\text{Int}\left(\frac{e^{\arcsin(a+bx)^2}}{b^2x^2}, x\right)$$

```
[Out] b^2*CannotIntegrate(exp(arcsin(b*x+a)^2)/b^2/x^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} dx = \int \frac{e^{\arcsin(a+bx)^2}}{x^2} dx$$

```
[In] Int[E^ArcSin[a + b*x]^2/x^2,x]
```

```
[Out] b*Defer[Subst][Defer[Int][(E^x^2*Cos[x])/(a - Sin[x])^2, x], x, ArcSin[a +
b*x]]
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int \frac{e^{x^2}\cos(x)}{\left(-\frac{a}{b}+\frac{\sin(x)}{b}\right)^2} dx, x, \arcsin(a+bx)\right)}{b} \\ &= \frac{\text{Subst}\left(\int \frac{b^2e^{x^2}\cos(x)}{(a-\sin(x))^2} dx, x, \arcsin(a+bx)\right)}{b} \end{aligned}$$

$$= b\text{Subst}\left(\int \frac{e^{x^2}\cos(x)}{(a-\sin(x))^2}\,dx, x, \arcsin(a+bx)\right)$$

Mathematica [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx$$

```
[In] Integrate[E^ArcSin[a + b*x]^2/x^2,x]
[Out] Integrate[E^ArcSin[a + b*x]^2/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.93

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)^2}}{x^2}dx$$

```
[In] int(exp(arcsin(b*x+a)^2)/x^2,x)
[Out] int(exp(arcsin(b*x+a)^2)/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2}\,dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="fricas")
[Out] integral(e^(arcsin(b*x + a)^2)/x^2, x)
```

Sympy [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} \, dx = \int \frac{e^{\operatorname{asin}^2(a+bx)}}{x^2} \, dx$$

```
[In] integrate(exp(asin(b*x+a)**2)/x**2,x)
[Out] Integral(exp(asin(a + b*x)**2)/x**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} \, dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="maxima")
[Out] integrate(e^(arcsin(b*x + a)^2)/x^2, x)
```

Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} \, dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2} \, dx$$

```
[In] integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="giac")
[Out] integrate(e^(arcsin(b*x + a)^2)/x^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}}{x^2}\,dx$$

```
[In] int(exp(asin(a + b*x)^2)/x^2,x)
[Out] int(exp(asin(a + b*x)^2)/x^2, x)
```

3.463 $\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 162

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\frac{144e^{\arcsin(ax)}}{629a}+\frac{144}{629}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{72e^{\arcsin(ax)}\left(1-a^2x^2\right)}{629a}+\frac{120}{629}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{30e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{629a}+\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^3}{37a}$$

```
[Out] 144/629*exp(arcsin(a*x))/a+72/629*exp(arcsin(a*x))*(-a^2*x^2+1)/a+120/629*e
xp(arcsin(a*x))*x*(-a^2*x^2+1)^(3/2)+30/629*exp(arcsin(a*x))*(-a^2*x^2+1)^2
/a+6/37*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(5/2)+1/37*exp(arcsin(a*x))*(-a^2*x
^2+1)^3/a+144/629*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4920, 6820, 6852, 4520, 2225}

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\frac{\left(1-a^2x^2\right)^3e^{\arcsin(ax)}}{37a}+\frac{6}{37}x\left(1-a^2x^2\right)^{5/2}e^{\arcsin(ax)}+\frac{30\left(1-a^2x^2\right)^2e^{\arcsin(ax)}}{629a}+\frac{120}{629}x\left(1-a^2x^2\right)^{3/2}e^{\arcsin(ax)}+\frac{72\left(1-a^2x^2\right)e^{\arcsin(ax)}}{629a}+\frac{144}{629}x\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{144e^{\arcsin(ax)}}{629a}$$

```
[In] Int[E^ArcSin[a*x]*(1 - a^2*x^2)^(5/2),x]
```

```
[Out] (144*E^ArcSin[a*x])/(629*a) + (144*E^ArcSin[a*x]*x*Sqrt[1 - a^2*x^2])/629 +
 (72*E^ArcSin[a*x]*(1 - a^2*x^2))/(629*a) + (120*E^ArcSin[a*x]*x*(1 - a^2*x
^2)^(3/2))/629 + (30*E^ArcSin[a*x]*(1 - a^2*x^2)^2)/(629*a) + (6*E^ArcSin[a
*x]*x*(1 - a^2*x^2)^(5/2))/37 + (E^ArcSin[a*x]*(1 - a^2*x^2)^3)/(37*a)
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 4520

```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
g[F]^2)), x] + (Dist[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^2*Log[F]^2), Int[F^(c
*(a + b*x))*Cos[d + e*x]^(m - 2), x], x] + Simp[e*m*F^(c*(a + b*x))*Sin[d +
 e*x]*(Cos[d + e*x]^(m - 1)/(e^2*m^2 + b^2*c^2*Log[F]^2)), x]) /; FreeQ[{F,
 a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^x \cos(x)\left(1-\sin^2(x)\right)^{5/2}\, dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\cos^2(x)^{5/2}\, dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos^6(x)\, dx, x, \arcsin(ax)\right)}{a}
\end{aligned}
$$

$$=\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^3}{37a}+\frac{30\text{Subst}\left(\int e^x\cos^4(x)\,dx,x,\arcsin(ax)\right)}{37a}$$

$$=\frac{120}{629}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{30e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{629a}+\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^3}{37a}+\frac{360\text{Subst}\left(\int e^x\cos^2(x)\,dx,x,\arcsin(ax)\right)}{629a}$$

$$=\frac{144}{629}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{72e^{\arcsin(ax)}\left(1-a^2x^2\right)}{629a}+\frac{120}{629}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{30e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{629a}+\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^3}{37a}+\frac{144\text{Subst}\left(\int e^x\,dx,x,\arcsin(ax)\right)}{629a}$$

$$=\frac{144e^{\arcsin(ax)}}{629a}+\frac{144}{629}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{72e^{\arcsin(ax)}\left(1-a^2x^2\right)}{629a}+\frac{120}{629}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{30e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{629a}+\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^3}{37a}$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.43

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\frac{e^{\arcsin(ax)}(6290+1887\cos(2\arcsin(ax))+222\cos(4\arcsin(ax))+17\cos(6\arcsin(ax))+37}{20128a}$$

```
[In] Integrate[E^ArcSin[a*x]*(1 - a^2*x^2)^(5/2),x]
```

```
[Out] (E^ArcSin[a*x]*(6290 + 1887*Cos[2*ArcSin[a*x]] + 222*Cos[4*ArcSin[a*x]] + 1
7*Cos[6*ArcSin[a*x]] + 3774*Sin[2*ArcSin[a*x]] + 888*Sin[4*ArcSin[a*x]] + 1
02*Sin[6*ArcSin[a*x]]))/(20128*a)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)}\left(-a^{2}x^{2}+1\right)^{\frac{5}{2}}dx$$

[In] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x)

[Out] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x)

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.44

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx = -\frac{\left(17\,a^{6}x^{6}-81\,a^{4}x^{4}+183\,a^{2}x^{2}-6\,(17\,a^{5}x^{5}-54\,a^{3}x^{3}+61\,ax)\sqrt{-a^{2}x^{2}+1}-263\right)e^{(\arcsin(ax))}}{629\,a}$$

[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="fricas")

[Out] -1/629*(17*a^6*x^6 - 81*a^4*x^4 + 183*a^2*x^2 - 6*(17*a^5*x^5 - 54*a^3*x^3 + 61*a*x)*sqrt(-a^2*x^2 + 1) - 263)*e^(arcsin(a*x))/a

Sympy [A] (verification not implemented)

Time = 13.73 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.87

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx = \begin{cases} -\frac{a^{5}x^{6}e^{\operatorname{asin}(ax)}}{37}+\frac{6a^{4}x^{5}\sqrt{-a^{2}x^{2}+1}e^{\operatorname{asin}(ax)}}{37}+\frac{81a^{3}x^{4}e^{\operatorname{asin}(ax)}}{629}-\frac{324a^{2}x^{3}\sqrt{-a^{2}x^{2}+1}e^{\operatorname{asin}(ax)}}{629}-\frac{183ax^{2}e^{\operatorname{asin}(ax)}}{629} \\ x \end{cases}$$

[In] integrate(exp(asin(a*x))*(-a**2*x**2+1)**(5/2),x)

[Out] Piecewise((-a**5*x**6*exp(asin(a*x))/37 + 6*a**4*x**5*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/37 + 81*a**3*x**4*exp(asin(a*x))/629 - 324*a**2*x**3*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/629 - 183*a*x**2*exp(asin(a*x))/629 + 366*x*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/629 + 263*exp(asin(a*x))/(629*a), Ne(a, 0)), (x, True))

Maxima [F]

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\int\left(-a^2x^2+1\right)^{\frac{5}{2}}e^{(\arcsin(ax))}\,dx$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((-a^2*x^2 + 1)^(5/2)*e^(arcsin(a*x)), x)
```

Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\int e^{\mathrm{asin}(a\,x)}\,\left(1-a^2\,x^2\right)^{5/2}\,dx$$

```
[In] int(exp(asin(a*x))*(1 - a^2*x^2)^(5/2),x)
```

```
[Out] int(exp(asin(a*x))*(1 - a^2*x^2)^(5/2), x)
```

3.464 $\int e^{\arcsin(ax)}(1-a^2x^2)^{3/2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 112

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\frac{24e^{\arcsin(ax)}}{85a}+\frac{24}{85}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{12e^{\arcsin(ax)}(1-a^2x^2)}{85a}+\frac{4}{17}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{17a}$$

```
[Out] 24/85*exp(arcsin(a*x))/a+12/85*exp(arcsin(a*x))*(-a^2*x^2+1)/a+4/17*exp(arc
sin(a*x))*x*(-a^2*x^2+1)^(3/2)+1/17*exp(arcsin(a*x))*(-a^2*x^2+1)^2/a+24/85
*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4920, 6820, 6852, 4520, 2225}

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\frac{\left(1-a^2x^2\right)^2e^{\arcsin(ax)}}{17a}+\frac{4}{17}x\left(1-a^2x^2\right)^{3/2}e^{\arcsin(ax)}+\frac{12(1-a^2x^2)\,e^{\arcsin(ax)}}{85a}+\frac{24}{85}x\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{24e^{\arcsin(ax)}}{85a}$$

```
[In] Int[E^ArcSin[a*x]*(1 - a^2*x^2)^(3/2),x]
```

```
[Out] (24*E^ArcSin[a*x])/(85*a) + (24*E^ArcSin[a*x]*x*Sqrt[1 - a^2*x^2])/85 + (12
*E^ArcSin[a*x]*(1 - a^2*x^2))/(85*a) + (4*E^ArcSin[a*x]*x*(1 - a^2*x^2)^(3/
2))/17 + (E^ArcSin[a*x]*(1 - a^2*x^2)^2)/(17*a)
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 4520

```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
g[F]^2)), x] + (Dist[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^2*Log[F]^2), Int[F^(c
*(a + b*x))*Cos[d + e*x]^(m - 2), x], x] + Simp[e*m*F^(c*(a + b*x))*Sin[d +
 e*x]*(Cos[d + e*x]^(m - 1)/(e^2*m^2 + b^2*c^2*Log[F]^2)), x]) /; FreeQ[{F,
 a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^x \cos(x)\left(1-\sin^2(x)\right)^{3/2}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\cos^2(x)^{3/2}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x \cos^4(x)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{4}{17}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{17a}+\frac{12\text{Subst}\left(\int e^x \cos^2(x)\,dx, x, \arcsin(ax)\right)}{17a}\\
&= \frac{24}{85}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{12e^{\arcsin(ax)}\left(1-a^2x^2\right)}{85a}+\frac{4}{17}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}\\
&\quad+\frac{e^{\arcsin(ax)}\left(1-a^2x^2\right)^2}{17a}+\frac{24\text{Subst}\left(\int e^x\,dx, x, \arcsin(ax)\right)}{85a}
\end{aligned}$$

$$= \frac{24e^{\arcsin(ax)}}{85a} + \frac{24}{85}e^{\arcsin(ax)}x\sqrt{1-a^2x^2} + \frac{12e^{\arcsin(ax)}(1-a^2x^2)}{85a} + \frac{4}{17}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2} + \frac{e^{\arcsin(ax)}(1-a^2x^2)^2}{17a}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.46

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2} dx = \frac{e^{\arcsin(ax)}(255 + 68\cos(2\arcsin(ax)) + 5\cos(4\arcsin(ax)) + 136\sin(2\arcsin(ax)) + 20\sin(4\arcsin(ax)))}{680a}$$

```
[In] Integrate[E^ArcSin[a*x]*(1 - a^2*x^2)^(3/2),x]
[Out] (E^ArcSin[a*x]*(255 + 68*Cos[2*ArcSin[a*x]] + 5*Cos[4*ArcSin[a*x]] + 136*Si
n[2*ArcSin[a*x]] + 20*Sin[4*ArcSin[a*x]]))/(680*a)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)}\left(-a^2x^2+1\right)^{\frac{3}{2}} dx$$

```
[In] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x)
[Out] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.49

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2} dx = \frac{\left(5\,a^4x^4 - 22\,a^2x^2 - 4\,(5\,a^3x^3 - 11\,ax)\sqrt{-a^2x^2+1} + 41\right)e^{(\arcsin(ax))}}{85\,a}$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="fricas")
[Out] 1/85*(5*a^4*x^4 - 22*a^2*x^2 - 4*(5*a^3*x^3 - 11*a*x)*sqrt(-a^2*x^2 + 1) +
41)*e^(arcsin(a*x))/a
```

Sympy [A] (verification not implemented)

Time = 1.39 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.85

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\begin{cases}\frac{a^3x^4e^{\operatorname{asin}(ax)}}{17}-\frac{4a^2x^3\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{17}-\frac{22ax^2e^{\operatorname{asin}(ax)}}{85}+\frac{44x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{85}+\frac{41e^{\operatorname{asin}(ax)}}{85a} & \text{for } a \neq \\ x & \text{otherw}\end{cases}$$

```
[In] integrate(exp(asin(a*x))*(-a**2*x**2+1)**(3/2),x)
```

```
[Out] Piecewise((a**3*x**4*exp(asin(a*x))/17 - 4*a**2*x**3*sqrt(-a**2*x**2 + 1)*e
xp(asin(a*x))/17 - 22*a*x**2*exp(asin(a*x))/85 + 44*x*sqrt(-a**2*x**2 + 1)*
exp(asin(a*x))/85 + 41*exp(asin(a*x))/(85*a), Ne(a, 0)), (x, True))
```

Maxima [F]

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\int\left(-a^2x^2+1\right)^{\frac{3}{2}}e^{(\arcsin(ax))}\,dx$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((-a^2*x^2 + 1)^(3/2)*e^(arcsin(a*x)), x)
```

Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)} \left(1-a^2x^2\right)^{3/2} \, dx = \int \mathrm{e}^{\mathrm{asin}(a\,x)} \, \left(1-a^2\,x^2\right)^{3/2} \, dx$$

```
[In] int(exp(asin(a*x))*(1 - a^2*x^2)^(3/2),x)
[Out] int(exp(asin(a*x))*(1 - a^2*x^2)^(3/2), x)
```

3.465 $\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 62

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx=\frac{2e^{\arcsin(ax)}}{5a}+\frac{2}{5}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{e^{\arcsin(ax)}(1-a^2x^2)}{5a}$$

```
[Out] 2/5*exp(arcsin(a*x))/a+1/5*exp(arcsin(a*x))*(-a^2*x^2+1)/a+2/5*exp(arcsin(a
*x))*x*(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4920, 6820, 6852, 4520, 2225}

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx=\frac{2}{5}x\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{(1-a^2x^2)\,e^{\arcsin(ax)}}{5a}+\frac{2e^{\arcsin(ax)}}{5a}$$

```
[In] Int[E^ArcSin[a*x]*Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*E^ArcSin[a*x])/(5*a) + (2*E^ArcSin[a*x]*x*Sqrt[1 - a^2*x^2])/5 + (E^ArcS
in[a*x]*(1 - a^2*x^2))/(5*a)
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 4520

```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
```

```
g[F]^2)), x] + (Dist[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^2*Log[F]^2), Int[F^(c
*(a + b*x))*Cos[d + e*x]^(m - 2), x], x] + Simp[e*m*F^(c*(a + b*x))*Sin[d +
 e*x]*(Cos[d + e*x]^(m - 1)/(e^2*m^2 + b^2*c^2*Log[F]^2)), x]) /; FreeQ[{F,
 a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int e^x \cos(x)\sqrt{1-\sin^2(x)}\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{\text{Subst}\left(\int e^x \cos(x)\sqrt{\cos^2(x)}\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{\text{Subst}\left(\int e^x \cos^2(x)\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{2}{5}e^{\arcsin(ax)}x\sqrt{1-a^2x^2} + \frac{e^{\arcsin(ax)}(1-a^2x^2)}{5a} + \frac{2\text{Subst}\left(\int e^x\,dx, x, \arcsin(ax)\right)}{5a} \\
&= \frac{2e^{\arcsin(ax)}}{5a} + \frac{2}{5}e^{\arcsin(ax)}x\sqrt{1-a^2x^2} + \frac{e^{\arcsin(ax)}(1-a^2x^2)}{5a}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.50

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \frac{e^{\arcsin(ax)}(5+\cos(2\arcsin(ax))+2\sin(2\arcsin(ax)))}{10a}$$

```
[In] Integrate[E^ArcSin[a*x]*Sqrt[1 - a^2*x^2],x]
[Out] (E^ArcSin[a*x]*(5 + Cos[2*ArcSin[a*x]] + 2*Sin[2*ArcSin[a*x]]))/(10*a)
```

Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)}\sqrt{-a^2x^2+1}dx$$

```
[In] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x)
[Out] int(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.56

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = -\frac{\left(a^2x^2-2\sqrt{-a^2x^2+1}ax-3\right)e^{(\arcsin(ax))}}{5\,a}$$

```
[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/5*(a^2*x^2 - 2*sqrt(-a^2*x^2 + 1)*a*x - 3)*e^(arcsin(a*x))/a
```

Sympy [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \begin{cases} -\frac{ax^2e^{\operatorname{asin}(ax)}}{5}+\frac{2x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{5}+\frac{3e^{\operatorname{asin}(ax)}}{5a} & \text{for } a\neq 0 \\ x & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x))*(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((-a*x**2*exp(asin(a*x))/5 + 2*x*sqrt(-a**2*x**2 + 1)*exp(asin(a*x
))/5 + 3*exp(asin(a*x))/(5*a), Ne(a, 0)), (x, True))
```

Maxima [F]

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \int \sqrt{-a^2x^2+1}e^{(\arcsin(ax))}\,dx$$

[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x)), x)

Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \int \mathrm{e}^{\mathrm{asin}(a\,x)}\,\sqrt{1-a^2\,x^2}\,dx$$

[In] int(exp(asin(a*x))*(1 - a^2*x^2)^(1/2),x)

[Out] int(exp(asin(a*x))*(1 - a^2*x^2)^(1/2), x)

3.466 $\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 21, antiderivative size = 10

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}} dx = \frac{e^{\arcsin(ax)}}{a}$$

```
[Out] exp(arcsin(a*x))/a
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4920, 6820, 6852, 2225}

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}} dx = \frac{e^{\arcsin(ax)}}{a}$$

```
[In] Int[E^ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
```

```
[Out] E^ArcSin[a*x]/a
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$\begin{aligned} \text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x \cos(x)}{\sqrt{1-\sin^2(x)}}\,dx, x, \arcsin(ax)\right)}{a} \\ &= \frac{\text{Subst}\left(\int e^x \sqrt{\cos^2(x)}\sec(x)\,dx, x, \arcsin(ax)\right)}{a} \\ &= \frac{\text{Subst}\left(\int e^x\,dx, x, \arcsin(ax)\right)}{a} \\ &= \frac{e^{\arcsin(ax)}}{a} \end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{\arcsin(ax)}}{a}$$

```
[In] Integrate[E^ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
[Out] E^ArcSin[a*x]/a
```

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00

method	result	size
derivativedivides	$\frac{e^{\arcsin(ax)}}{a}$	10
default	$\frac{e^{\arcsin(ax)}}{a}$	10

```
[In] int(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] exp(arcsin(a*x))/a
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] e^(arcsin(a*x))/a
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 8, normalized size of antiderivative = 0.80

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{e^{\operatorname{asin}(ax)}}{a} & \text{for}\ a \neq 0 \\ x & \text{otherwise} \end{cases}$$

```
[In] integrate(exp(asin(a*x))/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((exp(asin(a*x))/a, Ne(a, 0)), (x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] e^(arcsin(a*x))/a
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] e^(arcsin(a*x))/a
```

Mupad [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{\mathrm{e}^{\mathrm{asin}(a\,x)}}{a}$$

```
[In] int(exp(asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] exp(asin(a*x))/a
```

3.467 $\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 45

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

```
[Out] (4/5-8/5*I)*exp((1+2*I)*arcsin(a*x))*hypergeom([2, 1-1/2*I],[2-1/2*I],-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)/a
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4920, 6820, 6852, 4536}

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

```
[In] Int[E^ArcSin[a*x]/(1 - a^2*x^2)^(3/2),x]
```

```
[Out] ((4/5 - (8*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2, 2, 2
 - I/2, -E^((2*I)*ArcSin[a*x])])/a
```

Rule 4536

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_.), x_Symb
ol] :> Simp[2^n*E^(I*n*(d + e*x))*(F^(c*(a + b*x))/(I*e*n + b*c*Log[F]))*Hy
pergeometric2F1[n, n/2 - I*b*c*(Log[F]/(2*e)), 1 + n/2 - I*b*c*(Log[F]/(2*e
)), -E^(2*I*(d + e*x))], x] /; FreeQ[{F, a, b, c, d, e}, x] && IntegerQ[n]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{\left(1-\sin^2(x)\right)^{3/2}}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{\cos^2(x)^{3/2}}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\text{Subst}\left(\int e^x\sec^2(x)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)}}{\left(1-a^2x^2\right)^{3/2}}\,dx = \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

```
[In] Integrate[E^ArcSin[a*x]/(1 - a^2*x^2)^(3/2),x]
[Out] ((4/5 - (8*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2, 2, 2
- I/2, -E^((2*I)*ArcSin[a*x])])/a
```

Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{\left(-a^{2}x^{2}+1\right)^{\frac{3}{2}}}dx$$

```
[In] int(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x)
[Out] int(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x)
```

Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{\left(\arcsin(ax)\right)}}{\left(-a^{2}x^{2}+1\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/(a^4*x^4 - 2*a^2*x^2 + 1), x)
```

Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{\operatorname{asin}{\left(ax \right)}}}{\left(-\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(exp(asin(a*x))/(-a**2*x**2+1)**(3/2),x)
[Out] Integral(exp(asin(a*x))/(-(a*x - 1)*(a*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{\left(\arcsin(ax)\right)}}{\left(-a^{2}x^{2}+1\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(3/2), x)
```

Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{\mathrm{asin}(a\,x)}}{(1-a^2\,x^2)^{3/2}}\,dx$$

```
[In] int(exp(asin(a*x))/(1 - a^2*x^2)^(3/2),x)
[Out] int(exp(asin(a*x))/(1 - a^2*x^2)^(3/2), x)
```

3.468 $\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 96

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \frac{e^{\arcsin(ax)}x}{3(1-a^2x^2)^{3/2}} - \frac{e^{\arcsin(ax)}}{6a(1-a^2x^2)} + \frac{\left(\frac{2}{3}-\frac{4i}{3}\right)e^{(1+2i)\arcsin(ax)}\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

```
[Out] 1/3*exp(arcsin(a*x))*x/(-a^2*x^2+1)^(3/2)-1/6*exp(arcsin(a*x))/a/(-a^2*x^2+
1)+(2/3-4/3*I)*exp((1+2*I)*arcsin(a*x))*hypergeom([2, 1-1/2*I],[2-1/2*I],-(
I*a*x+(-a^2*x^2+1)^(1/2))^2)/a
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {4920, 6820, 6852, 4533, 4536}

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \frac{xe^{\arcsin(ax)}}{3(1-a^2x^2)^{3/2}} - \frac{e^{\arcsin(ax)}}{6a(1-a^2x^2)} + \frac{\left(\frac{2}{3}-\frac{4i}{3}\right)e^{(1+2i)\arcsin(ax)}\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

```
[In] Int[E^ArcSin[a*x]/(1 - a^2*x^2)^(5/2),x]
```

```
[Out] (E^ArcSin[a*x]*x)/(3*(1 - a^2*x^2)^(3/2)) - E^ArcSin[a*x]/(6*a*(1 - a^2*x^2
)) + ((2/3 - (4*I)/3)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2,
2, 2 - I/2, -E^((2*I)*ArcSin[a*x])])/a
```

Rule 4533

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_), x_Symbo
l] :> Simp[(-b)*c*Log[F]*F^(c*(a + b*x))*(Sec[d + e*x]^(n - 2)/(e^2*(n - 1)
*(n - 2))), x] + (Dist[(e^2*(n - 2)^2 + b^2*c^2*Log[F]^2)/(e^2*(n - 1)*(n -
 2)), Int[F^(c*(a + b*x))*Sec[d + e*x]^(n - 2), x], x] + Simp[F^(c*(a + b*x
))*Sec[d + e*x]^(n - 1)*(Sin[d + e*x]/(e*(n - 1))), x]) /; FreeQ[{F, a, b,
c, d, e}, x] && NeQ[b^2*c^2*Log[F]^2 + e^2*(n - 2)^2, 0] && GtQ[n, 1] && Ne
Q[n, 2]
```

Rule 4536

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_.), x_Symb
ol] :> Simp[2^n*E^(I*n*(d + e*x))*(F^(c*(a + b*x))/(I*e*n + b*c*Log[F]))*Hy
pergeometric2F1[n, n/2 - I*b*c*(Log[F]/(2*e)), 1 + n/2 - I*b*c*(Log[F]/(2*e
)), -E^(2*I*(d + e*x))], x] /; FreeQ[{F, a, b, c, d, e}, x] && IntegerQ[n]
```

Rule 4920

```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Dist[
1/b, Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin[
a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6852

```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p])), Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p}, x
] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(EqQ
[v, x] && EqQ[m, 1])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{(1-\sin^2(x))^{5/2}}\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{\text{Subst}\left(\int \frac{e^x\cos(x)}{\cos^2(x)^{5/2}}\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{\text{Subst}\left(\int e^x\sec^4(x)\,dx, x, \arcsin(ax)\right)}{a} \\
&= \frac{e^{\arcsin(ax)}x}{3(1-a^2x^2)^{3/2}} - \frac{e^{\arcsin(ax)}}{6a(1-a^2x^2)} + \frac{5\text{Subst}\left(\int e^x\sec^2(x)\,dx, x, \arcsin(ax)\right)}{6a}
\end{aligned}$$

$$= \frac{e^{\arcsin(ax)}x}{3(1-a^2x^2)^{3/2}} - \frac{e^{\arcsin(ax)}}{6a(1-a^2x^2)} + \frac{\left(\frac{2}{3}-\frac{4i}{3}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.88

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \frac{e^{\arcsin(ax)}\left(-1+\frac{2ax}{\sqrt{1-a^2x^2}}+(1-2i)\left(1+e^{2i\arcsin(ax)}\right)^2\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2\right.}{6(a-a^3x^2)}$$

```
[In] Integrate[E^ArcSin[a*x]/(1 - a^2*x^2)^(5/2),x]
[Out] (E^ArcSin[a*x]*(-1 + (2*a*x)/Sqrt[1 - a^2*x^2] + (1 - 2*I)*(1 + E^((2*I)*Ar
cSin[a*x]))^2*Hypergeometric2F1[1 - I/2, 2, 2 - I/2, -E^((2*I)*ArcSin[a*x])
]))/(6*(a - a^3*x^2))
```

Maple [F]

$$\int \frac{e^{\arcsin(ax)}}{(-a^2x^2+1)^{\frac{5}{2}}}dx$$

```
[In] int(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x)
[Out] int(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x)
```

Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/(a^6*x^6 - 3*a^4*x^4 + 3*a^2*x
^2 - 1), x)
```

Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{(-(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(exp(asin(a*x))/(-a**2*x**2+1)**(5/2),x)
[Out] Integral(exp(asin(a*x))/(-(a*x - 1)*(a*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="maxima")
[Out] integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(5/2), x)
```

Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="giac")
[Out] integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{\operatorname{asin}(a\,x)}}{(1-a^2\,x^2)^{5/2}}\,dx$$

```
[In] int(exp(asin(a*x))/(1 - a^2*x^2)^(5/2),x)
[Out] int(exp(asin(a*x))/(1 - a^2*x^2)^(5/2), x)
```

3.469 $\int \arcsin\left(\frac{c}{a+bx}\right) dx$

Optimal result

Integrand size = 10, antiderivative size = 47

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b} + \frac{c\,\text{arctanh}\left(\sqrt{1-\frac{c^2}{(a+bx)^2}}\right)}{b}$$

```
[Out] (b*x+a)*arccsc(a/c+b*x/c)/b+c*arctanh((1-c^2/(b*x+a)^2)^(1/2))/b
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4916, 5359, 379, 272, 65, 212}

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \frac{c\,\text{arctanh}\left(\sqrt{1-\frac{c^2}{(a+bx)^2}}\right)}{b} + \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}$$

```
[In] Int[ArcSin[c/(a + b*x)],x]
```

```
[Out] ((a + b*x)*ArcCsc[a/c + (b*x)/c])/b + (c*ArcTanh[Sqrt[1 - c^2/(a + b*x)^2]]
)/b
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 379

```
Int[(u_)^(m_.)*((a_) + (b_.)*(v_)^(n_))^(p_.), x_Symbol] :> Dist[u^m/(Coeff
icient[v, x, 1]*v^m), Subst[Int[x^m*(a + b*x^n)^p, x], x, v], x] /; FreeQ[{
a, b, m, n, p}, x] && LinearPairQ[u, v, x]
```

Rule 4916

```
Int[ArcSin[(c_.)/((a_.) + (b_.)*(x_)^(n_.))]^(m_.)*(u_.), x_Symbol] :> Int[
u*ArcCsc[a/c + b*(x^n/c)]^m, x] /; FreeQ[{a, b, c, n, m}, x]
```

Rule 5359

```
Int[ArcCsc[(c_) + (d_.)*(x_)], x_Symbol] :> Simp[(c + d*x)*(ArcCsc[c + d*x]
/d), x] + Int[1/((c + d*x)*Sqrt[1 - 1/(c + d*x)^2]), x] /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)\,dx \\
&= \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+\int \frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)\sqrt{1-\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}}}\,dx \\
&= \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+\frac{c\text{Subst}\left(\int \frac{1}{\sqrt{1-\frac{1}{x^2}}x}\,dx,x,\frac{a}{c}+\frac{bx}{c}\right)}{b} \\
&= \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}-\frac{c\text{Subst}\left(\int \frac{1}{\sqrt{1-xx}}\,dx,x,\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}\right)}{2b} \\
&= \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+\frac{c\text{Subst}\left(\int \frac{1}{1-x^2}\,dx,x,\sqrt{1-\frac{c^2}{(a+bx)^2}}\right)}{b}
\end{aligned}$$

$$= \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b} + \frac{c\,\text{arctanh}\left(\sqrt{1-\frac{c^2}{(a+bx)^2}}\right)}{b}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 529 vs. $2(47) = 94$.

Time = 2.78 (sec) , antiderivative size = 529, normalized size of antiderivative = 11.26

$$\int \arcsin\left(\frac{c}{a+bx}\right)\,dx = x\arcsin\left(\frac{c}{a+bx}\right)$$
$$- \frac{(a+bx)\sqrt{\frac{a^2-c^2+2abx+b^2x^2}{(a+bx)^2}}\left(\left(-c+\sqrt{-a^2+c^2}\right)\sqrt{-a^2+2c\left(c+\sqrt{-a^2+c^2}\right)}\arctan\left(\frac{b\sqrt{-a^2+2c\left(c+\sqrt{-\right.}}}{a\left(\sqrt{a^2-c^2}-\sqrt{a^2-c^2+2\right.}}\right.\right.}{}$$

```
[In] Integrate[ArcSin[c/(a + b*x)],x]
```

```
[Out] x*ArcSin[c/(a + b*x)] - ((a + b*x)*Sqrt[(a^2 - c^2 + 2*a*b*x + b^2*x^2)/(a
+ b*x)^2]*((-c + Sqrt[-a^2 + c^2])*Sqrt[-a^2 + 2*c*(c + Sqrt[-a^2 + c^2])]*
ArcTan[(b*Sqrt[-a^2 + 2*c*(c + Sqrt[-a^2 + c^2])]*x)/(a*(Sqrt[a^2 - c^2] -
Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]))] + (c + Sqrt[-a^2 + c^2])*Sqrt[a^2 +
2*c*(-c + Sqrt[-a^2 + c^2])]*ArcTanh[(b*Sqrt[a^2 - 2*c^2 + 2*c*Sqrt[-a^2 +
c^2]]*x)/(a*Sqrt[a^2 - c^2] - a*Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2])] + a*(
a*ArcTan[(b^2*c*Sqrt[a^2 - c^2]*x^2)/(a^4 + a^3*b*x + b^2*c^2*x^2 - a^2*(c^
2 + Sqrt[a^2 - c^2]*Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]))] + c*(-Log[Sqrt[a
^2 - c^2] - b*x - Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]] + Log[b^2*(Sqrt[a^2
- c^2] + b*x - Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2])]))))/(a*b*Sqrt[a^2 - c^
2 + 2*a*b*x + b^2*x^2])
```

Maple [A] (verified)

Time = 0.59 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

method	result
derivativedivides	$-\frac{c\left(-\frac{(bx+a)\arcsin\left(\frac{c}{bx+a}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(bx+a)^2}}}\right)\right)}{b}$
default	$-\frac{c\left(-\frac{(bx+a)\arcsin\left(\frac{c}{bx+a}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(bx+a)^2}}}\right)\right)}{b}$
parts	$x\arcsin\left(\frac{c}{bx+a}\right)+\frac{c\sqrt{b^2x^2+2abx+a^2-c^2}\left(a\ln\left(\frac{2\left(\sqrt{-c^2}\sqrt{b^2x^2+2abx+a^2-c^2}-c^2\right)b}{bx+a}\right)\sqrt{b^2}+\ln\left(\frac{b^2x+\sqrt{b^2x^2+2abx+a^2}}{\sqrt{b^2}}\right.\right.}{b\sqrt{\frac{b^2x^2+2abx+a^2-c^2}{(bx+a)^2}}(bx+a)\sqrt{b^2}\sqrt{-c^2}}$

[In] int(arcsin(c/(b*x+a)),x,method=_RETURNVERBOSE)

[Out] -1/b*c*(-1/c*(b*x+a)*arcsin(c/(b*x+a))-arctanh(1/(1-c^2/(b*x+a)^2)^(1/2)))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 141 vs. 2(45) = 90.

Time = 0.26 (sec) , antiderivative size = 141, normalized size of antiderivative = 3.00

$$\int \arcsin\left(\frac{c}{a+bx}\right)dx$$

$$=\frac{bx\arcsin\left(\frac{c}{bx+a}\right)-2a\arctan\left(-\frac{bx-(bx+a)\sqrt{\frac{b^2x^2+2abx+a^2-c^2}{b^2x^2+2abx+a^2}}+a}{c}\right)-c\log\left(-bx+(bx+a)\sqrt{\frac{b^2x^2+2abx+a^2-c^2}{b^2x^2+2abx+a^2}}-\right.}{b}$$

[In] integrate(arcsin(c/(b*x+a)),x, algorithm="fricas")

[Out] (b*x*arcsin(c/(b*x + a)) - 2*a*arctan(-(b*x - (b*x + a)*sqrt((b^2*x^2 + 2*a
*b*x + a^2 - c^2)/(b^2*x^2 + 2*a*b*x + a^2)) + a)/c) - c*log(-b*x + (b*x +
a)*sqrt((b^2*x^2 + 2*a*b*x + a^2 - c^2)/(b^2*x^2 + 2*a*b*x + a^2)) - a))/b

Sympy [F]

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \int \operatorname{asin}\left(\frac{c}{a+bx}\right) dx$$

```
[In] integrate(asin(c/(b*x+a)),x)
[Out] Integral(asin(c/(a + b*x)), x)
```

Maxima [F]

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \int \arcsin\left(\frac{c}{bx+a}\right) dx$$

```
[In] integrate(arcsin(c/(b*x+a)),x, algorithm="maxima")
[Out] x*arctan2(c, sqrt(b*x + a + c)*sqrt(b*x + a - c)) + integrate((b^2*c*x^2 +
a*b*c*x)*e^(1/2*log(b*x + a + c) + 1/2*log(b*x + a - c))/(b^2*c^2*x^2 + 2*a
*b*c^2*x + a^2*c^2 - c^4 + (b^2*x^2 + 2*a*b*x + a^2 - c^2)*e^(log(b*x + a +
 c) + log(b*x + a - c))), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 95 vs. $2(45) = 90$.

Time = 0.32 (sec) , antiderivative size = 95, normalized size of antiderivative = 2.02

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \frac{b\left(\frac{c^2\left(\log\left(\sqrt{-\frac{c^2}{(bx+a)^2}+1}+1\right)-\log\left(-\sqrt{-\frac{c^2}{(bx+a)^2}+1}+1\right)\right)}{b^2}+\frac{2\,(bx+a)c\arcsin\left(-\frac{c}{(bx+a)\left(\frac{a}{bx+a}-1\right)-a}\right)}{b^2}\right)}{2\,c}$$

```
[In] integrate(arcsin(c/(b*x+a)),x, algorithm="giac")
[Out] 1/2*b*(c^2*(log(sqrt(-c^2/(b*x + a)^2 + 1) + 1) - log(-sqrt(-c^2/(b*x + a)^
2 + 1) + 1))/b^2 + 2*(b*x + a)*c*arcsin(-c/((b*x + a)*(a/(b*x + a) - 1) - a
))/b^2)/c
```

Mupad [B] (verification not implemented)

Time = 0.74 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.89

$$\int \arcsin\left(\frac{c}{a+bx}\right)\,dx=\frac{c\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(a+b\,x)^2}}}\right)}{b}+\frac{\mathrm{asin}\left(\frac{c}{a+b\,x}\right)\,\left(a+b\,x\right)}{b}$$

```
[In] int(asin(c/(a + b*x)),x)
[Out] (c*atanh(1/(1 - c^2/(a + b*x)^2)^(1/2)))/b + (asin(c/(a + b*x))*(a + b*x))/
b
```

3.470 $\int \frac{x}{\arcsin(\sin(x))} \, dx$

Optimal result

Integrand size = 7, antiderivative size = 27

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = \arcsin(\sin(x)) + \log(\arcsin(\sin(x))) \left(-\arcsin(\sin(x)) + x\sqrt{\cos^2(x)}\sec(x)\right)$$

```
[Out] arcsin(sin(x))+ln(arcsin(sin(x)))*(-arcsin(sin(x))+x*sec(x)*(cos(x)^2)^(1/2
))
```

Rubi [F]

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = \int \frac{x}{\arcsin(\sin(x))} \, dx$$

```
[In] Int[x/ArcSin[Sin[x]],x]
```

```
[Out] Defer[Int][x/ArcSin[Sin[x]], x]
```

Rubi steps

$$\text{integral} = \int \frac{x}{\arcsin(\sin(x))} \, dx$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.04

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = -\arcsin(\sin(x))(-1+\log(\arcsin(\sin(x)))) + x\sqrt{\cos^2(x)}\log(\arcsin(\sin(x)))\sec(x)$$

```
[In] Integrate[x/ArcSin[Sin[x]],x]
[Out] -(ArcSin[Sin[x]]*(-1 + Log[ArcSin[Sin[x]]])) + x*Sqrt[Cos[x]^2]*Log[ArcSin[
Sin[x]]]*Sec[x]
```

Maple [F]

$$\int \frac{x}{\arcsin\left(\sin\left(x\right)\right)}dx$$

```
[In] int(x/arcsin(sin(x)),x)
[Out] int(x/arcsin(sin(x)),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 3, normalized size of antiderivative = 0.11

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = -x$$

```
[In] integrate(x/arcsin(sin(x)),x, algorithm="fricas")
[Out] -x
```

Sympy [F]

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = \int \frac{x}{\operatorname{asin}\left(\sin\left(x\right)\right)}\, dx$$

```
[In] integrate(x/asin(sin(x)),x)
[Out] Integral(x/asin(sin(x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 1, normalized size of antiderivative = 0.04

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = x$$

```
[In] integrate(x/arcsin(sin(x)),x, algorithm="maxima")
[Out] x
```

Giac [F]

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \int \frac{x}{\arcsin\left(\sin\left(x\right)\right)}\,dx$$

```
[In] integrate(x/arcsin(sin(x)),x, algorithm="giac")
[Out] sage0*x
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \int \frac{x}{\mathrm{asin}\left(\sin\left(x\right)\right)}\,dx$$

```
[In] int(x/asin(sin(x)),x)
[Out] int(x/asin(sin(x)), x)
```

3.471 $\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 38

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx=\frac{\sqrt{-bx^2}\arcsin\left(\sqrt{1+bx^2}\right)^{1+n}}{b(1+n)x}$$

```
[Out] arcsin((b*x^2+1)^(1/2))^(1+n)*(-b*x^2)^(1/2)/b/(1+n)/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {4918, 4737}

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx=\frac{\sqrt{-bx^2}\arcsin\left(\sqrt{bx^2+1}\right)^{n+1}}{b(n+1)x}$$

```
[In] Int[ArcSin[Sqrt[1 + b*x^2]]^n/Sqrt[1 + b*x^2],x]
```

```
[Out] (Sqrt[-(b*x^2)]*ArcSin[Sqrt[1 + b*x^2]]^(1 + n))/(b*(1 + n)*x)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4918

```
Int[ArcSin[Sqrt[1 + (b_.)*(x_)^2]]^(n_.)/Sqrt[1 + (b_.)*(x_)^2], x_Symbol]
:> Dist[Sqrt[(-b)*x^2]/(b*x), Subst[Int[ArcSin[x]^n/Sqrt[1 - x^2], x], x, S
qrt[1 + b*x^2]], x] /; FreeQ[{b, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-bx^2}\,\text{Subst}\left(\int \frac{\arcsin(x)^n}{\sqrt{1-x^2}}\,dx, x, \sqrt{1+bx^2}\right)}{bx}$$
$$= \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{1+bx^2}\right)^{1+n}}{b(1+n)x}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{1+bx^2}\right)^{1+n}}{b(1+n)x}$$

```
[In] Integrate[ArcSin[Sqrt[1 + b*x^2]]^n/Sqrt[1 + b*x^2],x]
[Out] (Sqrt[-(b*x^2)]*ArcSin[Sqrt[1 + b*x^2]]^(1 + n))/(b*(1 + n)*x)
```

Maple [F]

$$\int \frac{\arcsin\left(\sqrt{b\,x^2+1}\right)^n}{\sqrt{b\,x^2+1}}dx$$

```
[In] int(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x)
[Out] int(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{bx^2+1}\right)^n\arcsin\left(\sqrt{bx^2+1}\right)}{(bn+b)x}$$

```
[In] integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="fricas")
[Out] sqrt(-b*x^2)*arcsin(sqrt(b*x^2 + 1))^n*arcsin(sqrt(b*x^2 + 1))/((b*n + b)*x
)
```

Sympy [F]

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \begin{cases} \frac{2x}{\pi} & \text{for } b=0 \wedge n=-1 \\ x\left(\frac{\pi}{2}\right)^n & \text{for } b=0 \\ \int \frac{1}{\sqrt{bx^2+1}\operatorname{asin}\left(\sqrt{bx^2+1}\right)}\,dx & \text{for } n=-1 \\ \frac{\sqrt{-bx^2}\operatorname{asin}\left(\sqrt{bx^2+1}\right)\operatorname{asin}^n\left(\sqrt{bx^2+1}\right)}{bnx+bx} & \text{otherwise} \end{cases}$$

```
[In] integrate(asin((b*x**2+1)**(1/2))**n/(b*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x/pi, Eq(b, 0) & Eq(n, -1)), (x*(pi/2)**n, Eq(b, 0)), (Integra
l(1/(sqrt(b*x**2 + 1)*asin(sqrt(b*x**2 + 1))), x), Eq(n, -1)), (sqrt(-b*x**
2)*asin(sqrt(b*x**2 + 1))*asin(sqrt(b*x**2 + 1))**n/(b*n*x + b*x), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt(-_SAGE_VAR_b)
```

Giac [F]

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \int \frac{\arcsin\left(\sqrt{bx^2+1}\right)^n}{\sqrt{bx^2+1}}\,dx$$

```
[In] integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{b\,x^2+1}\right)^n}{\sqrt{b\,x^2+1}}\,dx$$

```
[In] int(asin((b*x^2 + 1)^(1/2))^n/(b*x^2 + 1)^(1/2),x)
[Out] int(asin((b*x^2 + 1)^(1/2))^n/(b*x^2 + 1)^(1/2), x)
```

3.472 $\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 30

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \frac{\sqrt{-bx^2}\log\left(\arcsin\left(\sqrt{1+bx^2}\right)\right)}{bx}$$

```
[Out] ln(arcsin((b*x^2+1)^(1/2)))*(-b*x^2)^(1/2)/b/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {4918, 4735}

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \frac{\sqrt{-bx^2}\log\left(\arcsin\left(\sqrt{bx^2+1}\right)\right)}{bx}$$

```
[In] Int[1/(Sqrt[1 + b*x^2]*ArcSin[Sqrt[1 + b*x^2]]),x]
[Out] (Sqrt[-(b*x^2)]*Log[ArcSin[Sqrt[1 + b*x^2]]])/(b*x)
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rule 4918

```
Int[ArcSin[Sqrt[1 + (b_.)*(x_)^2]]^(n_.)/Sqrt[1 + (b_.)*(x_)^2], x_Symbol]
:> Dist[Sqrt[(-b)*x^2]/(b*x), Subst[Int[ArcSin[x]^n/Sqrt[1 - x^2], x], x, S
```

```
qrt[1 + b*x^2]], x] /; FreeQ[{b, n}, x]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{-bx^2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}\arcsin(x)}\,dx, x, \sqrt{1+bx^2}\right)}{bx}$$
$$= \frac{\sqrt{-bx^2}\log\left(\arcsin\left(\sqrt{1+bx^2}\right)\right)}{bx}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = -\frac{x\log\left(\arcsin\left(\sqrt{1+bx^2}\right)\right)}{\sqrt{-bx^2}}$$

```
[In] Integrate[1/(Sqrt[1 + b*x^2]*ArcSin[Sqrt[1 + b*x^2]]),x]
[Out] -((x*Log[ArcSin[Sqrt[1 + b*x^2]]])/Sqrt[-(b*x^2)])
```

Maple [F]

$$\int \frac{1}{\arcsin\left(\sqrt{b\,x^2+1}\right)\sqrt{b\,x^2+1}}dx$$

```
[In] int(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x)
[Out] int(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \frac{\sqrt{-bx^2}\log\left(-\arcsin\left(\sqrt{bx^2+1}\right)\right)}{bx}$$

```
[In] integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="fricas")
[Out] sqrt(-b*x^2)*log(-arcsin(sqrt(b*x^2 + 1)))/(b*x)
```

Sympy [F]

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \int \frac{1}{\sqrt{bx^2+1}\,\operatorname{asin}\left(\sqrt{bx^2+1}\right)}\,dx$$

```
[In] integrate(1/asin((b*x**2+1)**(1/2))/(b*x**2+1)**(1/2),x)
[Out] Integral(1/(sqrt(b*x**2 + 1)*asin(sqrt(b*x**2 + 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found sqrt(-_SAGE_VAR_b)
```

Giac [F]

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \int \frac{1}{\sqrt{bx^2+1}\arcsin\left(\sqrt{bx^2+1}\right)}\,dx$$

```
[In] integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(b*x^2 + 1)*arcsin(sqrt(b*x^2 + 1))), x)
```

Mupad [B] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = -\frac{\ln\left(\operatorname{asin}\left(\sqrt{b\,x^2+1}\right)\right)\,\sqrt{x^2}}{\sqrt{-b}\,x}$$

```
[In] int(1/(asin((b*x^2 + 1)^(1/2))*(b*x^2 + 1)^(1/2)),x)
[Out] -(log(asin((b*x^2 + 1)^(1/2)))*(x^2)^(1/2))/((-b)^(1/2)*x)
```

3.473 $\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right) dx$

Optimal result

Integrand size = 28, antiderivative size = 16

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right) dx = -\frac{1}{2}\log\left(1-x^2\right)+\log(\arcsin(x))$$

```
[Out] -1/2*ln(-x^2+1)+ln(arcsin(x))
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {266, 4735}

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right) dx = \log(\arcsin(x))-\frac{1}{2}\log\left(1-x^2\right)$$

```
[In] Int[x/(1 - x^2) + 1/(Sqrt[1 - x^2]*ArcSin[x]),x]
```

```
[Out] -1/2*Log[1 - x^2] + Log[ArcSin[x]]
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
```

```
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \frac{x}{1-x^2}\,dx + \int \frac{1}{\sqrt{1-x^2}\arcsin(x)}\,dx \\ &= -\frac{1}{2}\log\left(1-x^2\right) + \log(\arcsin(x))\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \left(\frac{x}{1-x^2} + \frac{1}{\sqrt{1-x^2}\arcsin(x)}\right) dx = -\frac{1}{2}\log\left(1-x^2\right) + \log(\arcsin(x))$$

```
[In] Integrate[x/(1 - x^2) + 1/(Sqrt[1 - x^2]*ArcSin[x]),x]
[Out] -1/2*Log[1 - x^2] + Log[ArcSin[x]]
```

Maple [A] (verified)

Time = 0.49 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

method	result	size
default	$-\frac{\ln(x-1)}{2} - \frac{\ln(x+1)}{2} + \ln\left(\arcsin\left(x\right)\right)$	17
parts	$-\frac{\ln(x-1)}{2} - \frac{\ln(x+1)}{2} + \ln\left(\arcsin\left(x\right)\right)$	17

```
[In] int(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2*ln(x-1)-1/2*ln(x+1)+ln(arcsin(x))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \left(\frac{x}{1-x^2} + \frac{1}{\sqrt{1-x^2}\arcsin(x)}\right) dx = -\frac{1}{2}\log\left(x^2-1\right) + \log\left(-\arcsin\left(x\right)\right)$$

```
[In] integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/2*log(x^2 - 1) + log(-arcsin(x))
```

Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{\log\left(x^2-1\right)}{2}+\log\left(\operatorname{asin}\left(x\right)\right)$$

```
[In] integrate(x/(-x**2+1)+1/asin(x)/(-x**2+1)**(1/2),x)
[Out] -log(x**2 - 1)/2 + log(asin(x))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\log\left(x^2-1\right)+\log\left(\arcsin\left(x\right)\right)$$

```
[In] integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/2*log(x^2 - 1) + log(arcsin(x))
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\log\left(\left|x^2-1\right|\right)+\log\left(\left|\arcsin\left(x\right)\right|\right)$$

```
[In] integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*log(abs(x^2 - 1)) + log(abs(arcsin(x)))
```

Mupad [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=\ln\left(\operatorname{asin}(x)\right)-\frac{\ln\left(x^2-1\right)}{2}$$

```
[In] int(1/(asin(x)*(1 - x^2)^(1/2)) - x/(x^2 - 1),x)
[Out] log(asin(x)) - log(x^2 - 1)/2
```

3.474 $\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 16

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx = -\frac{1}{2}\log\left(1-x^2\right)+\log(\arcsin(x))$$

```
[Out] -1/2*ln(-x^2+1)+ln(arcsin(x))
```

Rubi [F]

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx = \int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx$$

```
[In] Int[(Sqrt[1 - x^2] + x*ArcSin[x])/(ArcSin[x] - x^2*ArcSin[x]),x]
[Out] Defer[Int][(Sqrt[1 - x^2] + x*ArcSin[x])/((1 - x^2)*ArcSin[x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{1-x^2}+x\arcsin(x)}{(1-x^2)\arcsin(x)}\,dx$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.38

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)}\,dx=-\frac{1}{2}\log(1-x)-\frac{1}{2}\log(1+x)+\log(\arcsin(x))$$

```
[In] Integrate[(Sqrt[1 - x^2] + x*ArcSin[x])/(ArcSin[x] - x^2*ArcSin[x]),x]
[Out] -1/2*Log[1 - x] - Log[1 + x]/2 + Log[ArcSin[x]]
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

method	result	size
default	$-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln\left(\arcsin\left(x\right)\right)$	17
parts	$-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln\left(\arcsin\left(x\right)\right)$	17

```
[In] int((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x,method=_RETURN
VERBOSE)
[Out] -1/2*ln(x-1)-1/2*ln(x+1)+ln(arcsin(x))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)}\,dx=-\frac{1}{2}\log\left(x^2-1\right)+\log\left(-\arcsin\left(x\right)\right)$$

```
[In] integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algorit
hm="fricas")
[Out] -1/2*log(x^2 - 1) + log(-arcsin(x))
```

Sympy [F]

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)}\,dx = -\int \frac{\sqrt{1-x^2}}{x^2 \operatorname{asin}(x)-\operatorname{asin}(x)}\,dx - \int \frac{x \operatorname{asin}(x)}{x^2 \operatorname{asin}(x)-\operatorname{asin}(x)}\,dx$$

```
[In] integrate((x*asin(x)+(-x**2+1)**(1/2))/(asin(x)-x**2*asin(x)),x)
[Out] -Integral(sqrt(1 - x**2)/(x**2*asin(x) - asin(x)), x) - Integral(x*asin(x)/
(x**2*asin(x) - asin(x)), x)
```

Maxima [F]

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)}\,dx = \int -\frac{x \arcsin(x)+\sqrt{-x^2+1}}{x^2 \arcsin(x)-\arcsin(x)}\,dx$$

```
[In] integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algorit
hm="maxima")
[Out] -integrate(sqrt(x + 1)*sqrt(-x + 1)/((x^2 - 1)*arctan2(x, sqrt(x + 1)*sqrt(
-x + 1))), x) - 1/2*log(x + 1) - 1/2*log(x - 1)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.25

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)}\,dx = -\log(2) - \frac{1}{2}\log\left(\left|-x^2+1\right|\right) + \log\left(\left|\arcsin(x)\right|\right)$$

```
[In] integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algorit
hm="giac")
[Out] -log(2) - 1/2*log(abs(-x^2 + 1)) + log(abs(arcsin(x)))
```

Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx=\ln\left(\operatorname{asin}(x)\right)-\frac{\ln\left(x^2-1\right)}{2}$$

```
[In] int((x*asin(x) + (1 - x^2)^(1/2))/(asin(x) - x^2*asin(x)),x)
[Out] log(asin(x)) - log(x^2 - 1)/2
```

CHAPTER 4

APPENDIX

4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
```

```
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafCou
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A",""}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count is
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A",""}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $"<
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<>T
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
```

```
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
```

```
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
```

```
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                convert(leaf_count_result,string)," vs. $2 (",
```

```
                                    convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well")
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A"," ";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of opt
                                    convert(leaf_count_result,string),"$ vs. $2(",
                                    convert(leaf_count_optimal,string),")=",convert(2*leaf_coun
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                        convert(ExpnType_result,string)," vs. order ",
                        convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:
```

```
# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
```

```
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#             Port of original Maple grading function by
#             Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#             added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]

def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
        return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnTy
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)    #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is large
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(le
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_
```

```
    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#              issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-t
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
      return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
         return 1
      else:
         return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
   elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
      if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
         return expnType(expn.operands()[0])    #expnType(expn.args[0])
      elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
         if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))  #max(3,expnType(expn.
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinst
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):



    if debug:
        print ("Enter grade_antiderivative for sagemath")
        print("Enter grade_antiderivative, result=",result)
        print("Enter grade_antiderivative, optimal=",optimal)
        print("type(anti)=",type(result))
        print("type(optimal)=",type(optimal))

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)



    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger th
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_c
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_result


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```